Vol. 37 Toronto, July 4, 1923 No 27

Contract Record and Engineering Review

CANADA CEMENT BUILDING

MONTREAL

Barott & Blackader - - Architects
Geo. A. Fuller Co. Ltd., - - Builders
Crane Ltd., - - Plumbing Fixtures
W. G. Edge Ltd., - Plumbing Contractor

Equipped throughout with—

Royal Flush Valves

SLOAN VALVE CO., LTD.
67 Adelaide St. E.
TORONTO

Alphabetical Index to Advertisers Page 16 Classified Directory to Advertisements Page 6

Link-Belt Quality in an All-Purpose Crawler Crane

SOUND in engineering principles and construction, durability, strength and long life—these are characteristic of Link-Belt products.

The Link-Belt Crawler Crane is no exception. It is mechanically right, easily operated by one man, and is designed for a wide range of usage.

It can make four complete rotations per minute, travels one mile per hour, and can easily climb a 25 per cent. grade.

It weighs 27 tons. Will lift 12 tons at 12 ft. radius, or 3½ tons at 30 ft. radius. Operates with any type of bucket, and can also be used with electric lifting magnet, or pile driver attachment.

Write for specifications, price and delivery date. Send for book No. 595.

CANADIAN LINK-BELT COMPANY, LTD.

TORONTO—WELLINGTON AND PETER STREETS MONTREAL—10 GAUVIN LANE

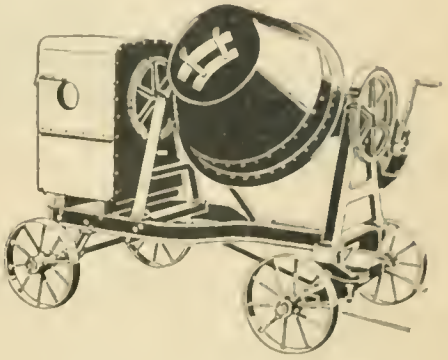
LINK-BELT

LONDON CONCRETE MIXERS AND CONTRACTORS' EQUIPMENT

is built exclusively in Canada under manufacturing and engineering methods which are equal to any

London Concrete Cart No. 6

Our Machines are being used on important contracts not only in Canada but also in many foreign countries.

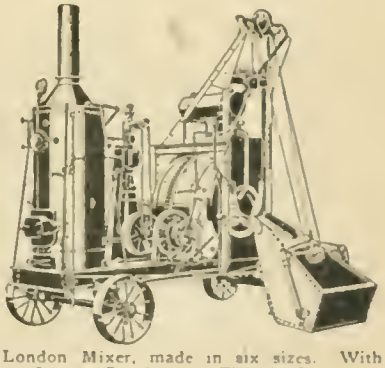


London Mixer, made in two sizes

BECAUSE—we embody in each machine everything that engineering skill, modern factory methods and long experience can produce. Every machine is sold with a straight guarantee of satisfaction and is backed by a Canadian Company of strong financial standing.

London Mixer, made in three sizes

Our success in business depends entirely upon the success that our customers have with our machines. The enormous sale of our products is evidence that the users of LONDON EQUIPMENT are satisfied. Send for catalogue.



London Mixer, made in six sizes. With Steam, Gasoline or Electric Power

Made in Canada

We manufacture Concrete Mixers, Hoists, Air Compressors, Pumps, Brick, Block and Tile Machines, Barrows, Carts, Silo Moulds, Ornamental Moulds and Tools.

The London Concrete Machinery Co., Limited

Dept. 7 London, Canada

World's Largest Manufacturers of Concrete Machinery

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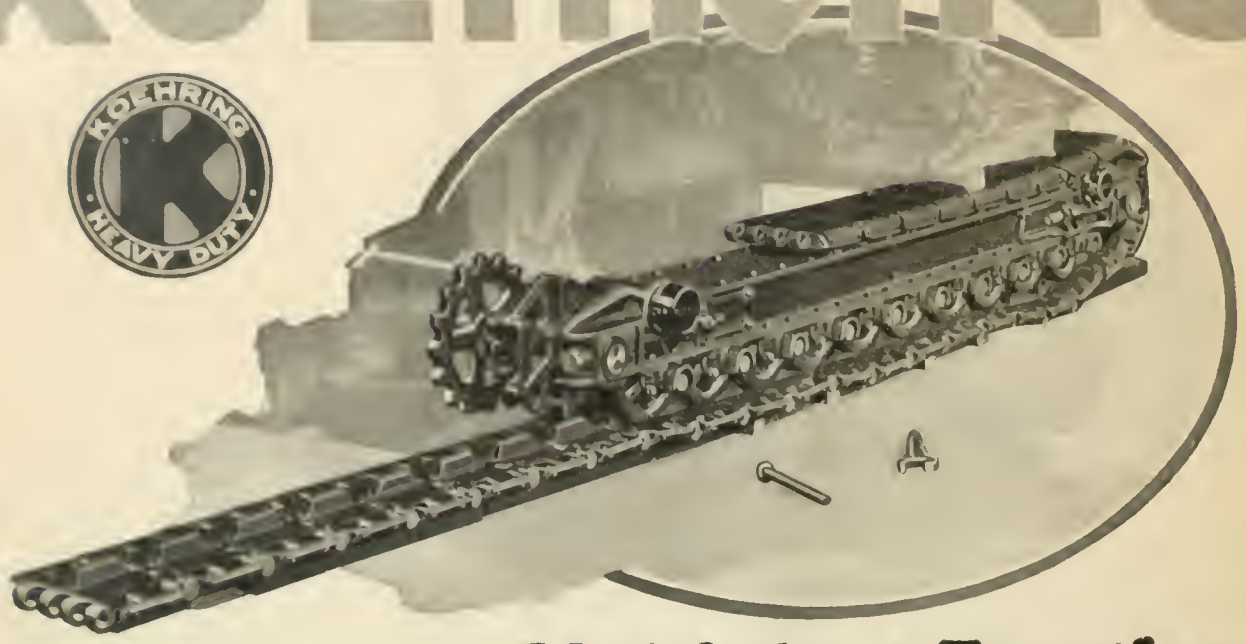
KOEHRING



Multiplane Traction with Three Point Suspension

THIS is another Koehring "HEAVY DUTY" feature not common to this type of traction.

Three point suspension which is accepted as indispensable to good mechanical mixer construction is retained with Koehring multiplane traction. Nothing but three point suspension can protect mixer frame from terriffic strains.

Liberal width planes give lowest ground pressure per square inch.

Rollers mounted rigidly in one unit, distribute strain of climbing an obstacle over all rollers —a construction that forestalls breakages.

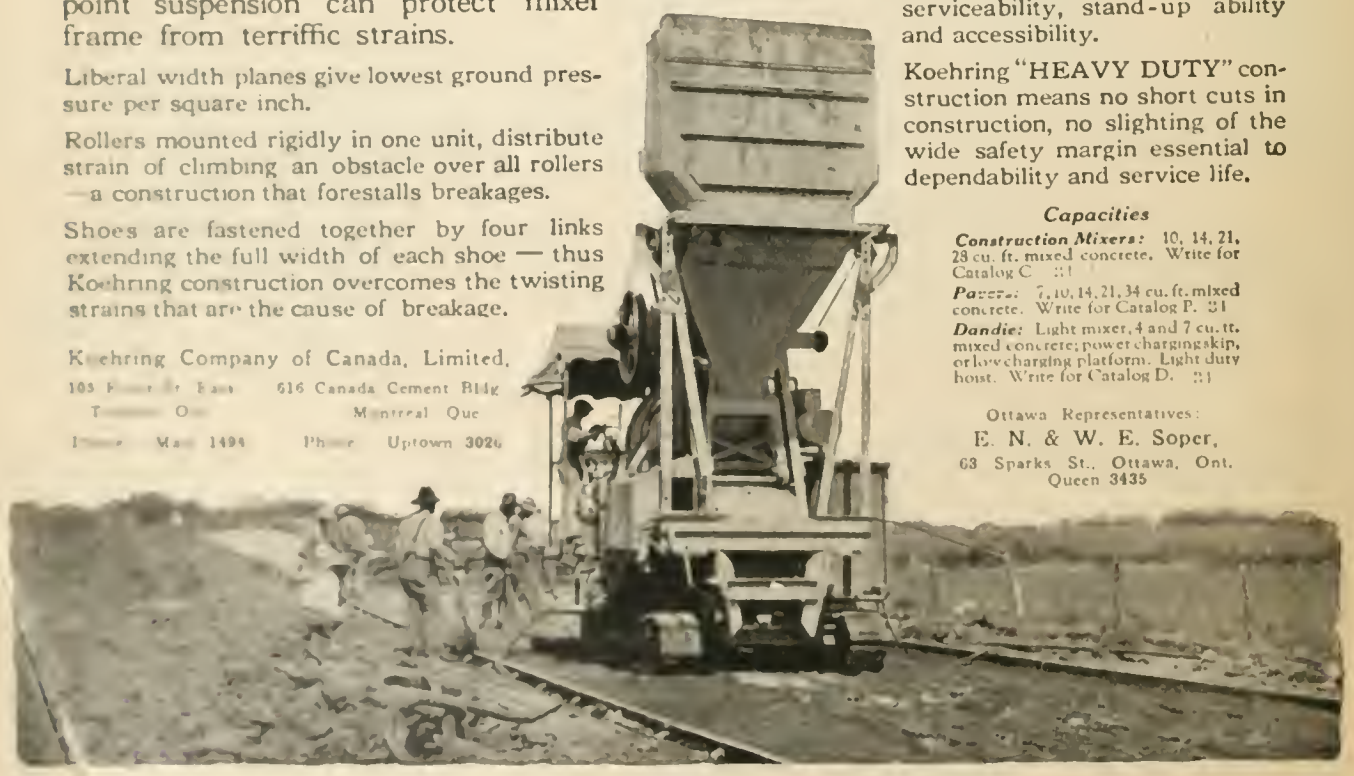
Shoes are fastened together by four links extending the full width of each shoe — thus Koehring construction overcomes the twisting strains that are the cause of breakage.

The remarkable accessibility of the Koehring multiplane is a special Koehring feature. Pins are easily removable.

Mixer can be jacked up and entire multiplane unit can be easily removed.

The Koehring multiplane is a measurable improvement in this type of traction — in serviceability, stand-up ability and accessibility.

Koehring "HEAVY DUTY" construction means no short cuts in construction, no slighting of the wide safety margin essential to dependability and service life.



Capacities

Construction Mixers: 10, 14, 21, 28 cu. ft. mixed concrete. Write for Catalog C 31

Pavers: 7, 10, 14, 21, 34 cu. ft. mixed concrete. Write for Catalog P. 31

Dandie: Light mixer, 4 and 7 cu. ft. mixed concrete; power charging skip, or low charging platform. Light duty hoist. Write for Catalog D. 31

Koehring Company of Canada, Limited,

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Toronto Ont. — Montreal Que

Phone Main 1494 — Phone Uptown 3026

Ottawa Representatives:
E. N. & W. E. Soper,
63 Sparks St., Ottawa, Ont.
Queen 3435

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BRAND
CEMENT WATER-PROOFING POWDER

will protect your buildings from

Water and Damp

It is the one sure means of making all cement and concrete work permanently impermeable to water, damp and oil. It slightly strengthens concrete, and improves with age. Easy to use—no extra labor.

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St. John, N B. . . . . T. McAvity & Sons
Winnipeg, Edmonton, Calgary and Saskatoon.....Winnipeg Paint & Glass Company Ltd.

The Largest Manufacturers of Concrete Pipe in Canada

This represents a twin 48-in. culvert with concrete wing-walls and bulkheads. It is built on a concrete foundation and replaced a fair-sized wooden bridge on the river road in Oxford Township, Grenville County, Ontario.

DOMINION CONCRETE COMPANY, LTD. Incorporated 1904 **KEMPTVILLE, ONT.**

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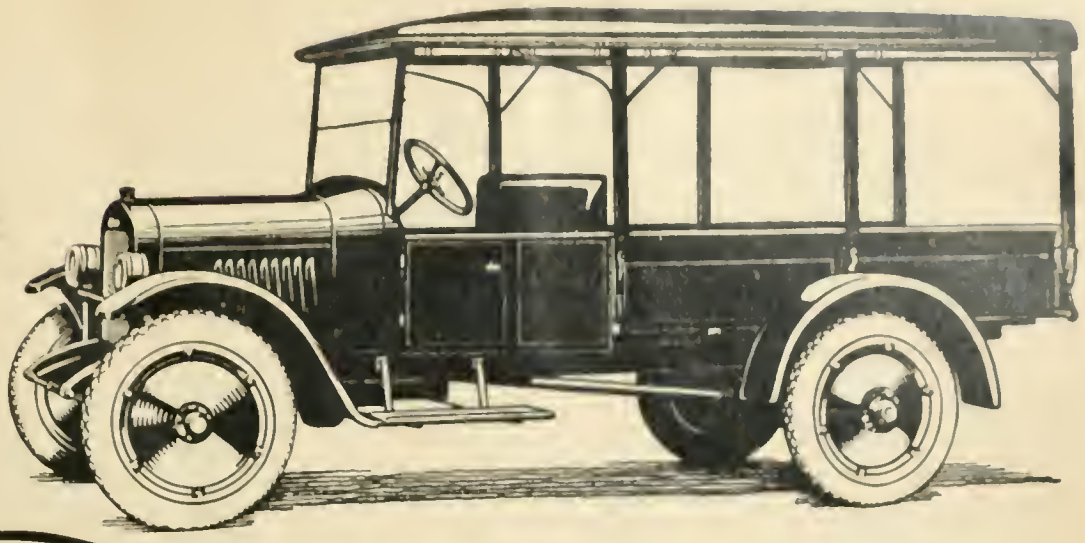
(Continued on page 8)

The New Stewart 1-Ton Truck

Bodies for Every Business



FOR **$1495** CHASSIS

Matches Trucks Costing up to $2300

Alters All Truck Values— A Simple Way to Prove It

On all major points the new Stewart one-ton truck matches trucks costing from $2000 to $2300 Check the specifications. Or better still come see and compare it with speed trucks costing from $500 to $800 more. Many important standardized parts are the same. In other features Stewart excels even these costlier trucks. The frame for instance is sturdier; bigger bearings; longer, stronger springs. Modern 5-bearing crankshaft motor. Fast, powerful, reliable. Not a one year truck. Built to last for years in steady economical duty. Deep, cushion seats for driver comfort. An examination will convince you. **With body and complete equipment the Stewart one-ton truck costs less than the chassis alone of many trucks which it will out-perform and outlast.**

Disc steel wheels—Demountable rims. Cord tires, 34" x 4½"

A Few of the Many Units in the Stewart 1-Ton Truck, Which Equals Those Used by Far Costlier Trucks

Motor—5-bearing crank shaft. Pressure feed lubricating, automatic control. Removable cylinder head and block. Matches motors of trucks costing up to $2300

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Axles—Front, I-beam, drop-forged. Rear, spiral bevel gear, heavy Brown-Lipe differential. All Timken roller bearings. Equal to trucks costing $2300

Zenith carburetor, Remy ignition, starter, generator, Gemmer steering. All found in trucks costing $2000 to $2300

Cooling—Cellular type core, pressed steel shell. Extra strong chassis frame, 6" at greatest depth. Equals trucks costing $2000 to $2300

Stewart MOTOR TRUCKS

Distributed by

COMMERCIAL CARS OF CANADA LIMITED
115 Dupont St., TORONTO
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WINNIPEG, Man.

AUTO GARAGE HAMILTON LIMITED,
69-71 Hughson St. South,
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Sturtevant, B. F. & Co.

Fans, Propeller
Sturtevant, B. F. & Co.

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Sturtevant, B. F. & Co.

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Dominion Concrete Machry Co.

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Plaster
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Plastering
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Inglis Co., John

Prisms
Luxfer Prism Co.

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Sturtevant, B. F. & Co.

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(Continued on page 10)

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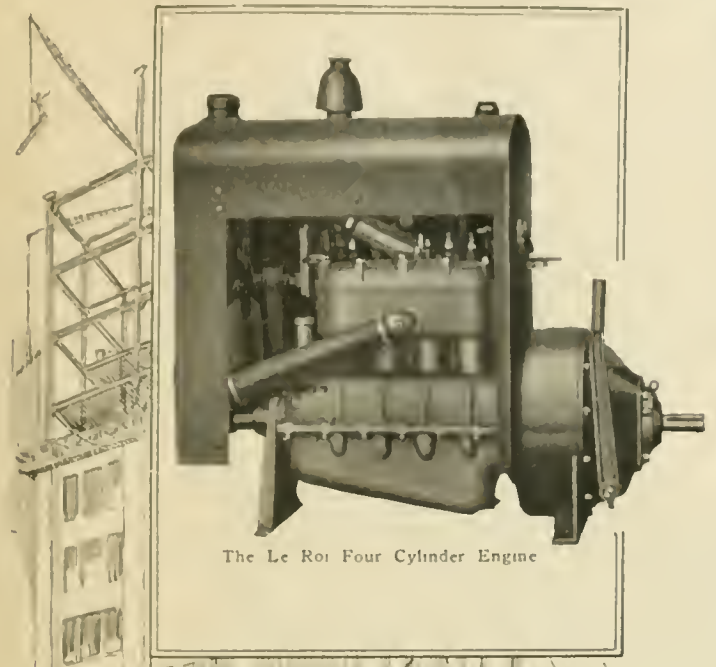


The Le Roi Four Cylinder Engine

Power or Price?

Do you buy your engines on a power basis or a price basis?

The successful contractor or engineer buys his engines on a power and serviceability basis.

He knows that engine economy lies in purchasing the engine that supplies steady, untiring power at the lowest operating cost, not at the lowest engine price cost.

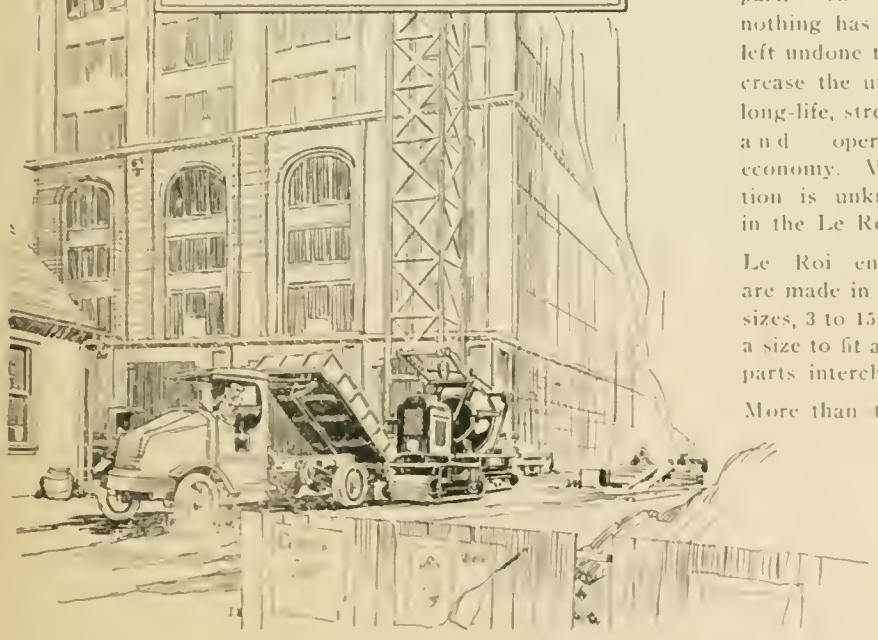
Le Roi engines have a reputation for their dependable power. They have been designed and built to do more than is expected or claimed for them. Extra strength to give extra power is built into every part. In fact nothing has been left undone to increase the utility, long-life, strength and operating economy. Vibration is unknown in the Le Roi.

The Le Roi Two Cylinder Engine

Le Roi engines are made in three sizes, 3 to 15 H.P. a size to fit any kind or size of job—with all working parts interchangeable.

More than 40,000 satisfied users highly endorse and recommend Le Roi engines as standard power units on concrete mixers, pumps, hoists, air compressors, etc.

Let us send you an interesting folder illustrating and fully describing the various sizes and types.



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"for dependable power"

CLASSIFIED INDEX TO ADVERTISEMENTS—Continued

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Reinforcements Concrete & Steel
[illegible]
Canada Iron & Wire Co
[illegible]
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Reinforcement Ties
[illegible]

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[illegible]

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[illegible]

Riveted Steam
[illegible]

Road Drags
[illegible]

Road Asphalt
[illegible]

Road Machinery
Baker Mfg. Co
Barnard & Perkins
Canadian Austin Machinery
Can. Fairbanks-Morse Co., Ltd
[illegible]
Kennedy Bros. of Canada
[illegible]
[illegible]
Sawyer-Massey Co
Waterous Engine Works Co
[illegible]

Road Materials
Barrett Company, Ltd.
[illegible]

Road Oil
Barrett Company, Ltd
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Barrett Company, Ltd.
[illegible]

Roofing Contractors
A. W. Carmichael Ltd

Roofing Cement
Barrett Company, Ltd.
[illegible]

Roofing Material
Barrett Company, Ltd.
Brantford Roofing Co.
Canadian [illegible]
[illegible]
Imperial Oil Company Ltd
Vitrified Clay Pipe Publicity Bureau

Rope
Leckie Co. John

Rolling Steel Doors
[illegible]

Rubble Stone
[illegible]

Sand
[illegible]

Saws
[illegible]

Screens
[illegible]

Sewer Pipe
[illegible]

Sewer Cleaning Machines
[illegible]

Sewer Pipe
[illegible]
National Iron Works

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Sheathing
Barrett Company, Ltd.

Smoke Stain Oil
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Shovels (Steam)
Bay Engine Co
Canadian Austin Machinery
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Erie Steam Shovel Co.
Hopkins & Co., Ltd., F. H.
McGraven, T. J.
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Silo Material
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London Concrete Machry. Co.

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Canadian Blower & Forge Co.
Hamilton Bridge Works Co.
MacKinnon Steel Company
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Canadian Blower & Forge Co.
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Steam Pipe Casing (Wood Stave)
British Empire Steel Corporation
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Steel Pipe
Canadian Des Moines Steel Co
Lacroix Steel Works, Ltd
[illegible]

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[illegible]
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Burlington Steel Company
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Operating the Welding and Cutting Gas Division of
PREST-O-LITE COMPANY OF CANADA, LIMITED

McCRACKEN SEWER PIPE
Is Winning Canada's Favor

A.F.Mc.Callum, Commissioner of Works, Ottawa Says:-

In reply to published criticism of the action of city council in adopting the McCallum recommendation for concrete pipe as against vitrified clay pipe. (See Ottawa Citizen April 20th, 1923.)

Mr. McCallum's letter to the Board of Control reads:-

"CONCRETE pipe is not an experiment. It was used in the United States eighty-five years ago, being imported from Scotland. It was so high in cost that after a few years clay pipe was substituted for the smaller sized sewers, but several cities have concrete pipe laid from 50 to 80 years ago.

"Brick was used in the larger sewers until the price of cement had lowered sufficiently to use concrete and in most cases brick is no longer used. Yet this same agitation was started by the same people in favor of brick about 15 years ago using the same arguments.

"The clay pipe people do not question the strength of concrete pipe for obvious reasons. The city engineer at St. Lambert, P.Q., made tests of 18-in. clay and concrete pipe such as we are getting. The clay pipe broke at 4.610 pounds and the concrete at 11.285 pounds.

"They then base all on supposed acids, in sewage; sewage flowing in sewers is not septic and putrefaction does not take place until it reaches the disposal works or outlets. Yet these disposal works are all made of concrete and no failures have been recorded in this country."

Write for complete information and quotations

John E. Russell Co. Limited, General Sales Agents
504 Harbor Administration Building - TORONTO

McCracken Pipe is manufactured in accordance with standard specifications issued by American Society for Testing Materials for Cement-Concrete Sewer Pipe, and inspected by the Canadian Inspection and Testing Company, Limited.

McCRACKEN SEWER PIPE
"The Pipe That Endures"

Steel Bars

Bent and Cut as Desired

WHENEVER you are in need of steel bars for concrete reinforcement, get in touch with us. We can make prompt delivery in any quantity — ROUNDS, SQUARES, FLATS, ANGLES.

Material supplied with following limits—
Rounds from ¼" to 1½"
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Angles from ¾" to 4"
Annealed wire.
Nails, Washers, Spikes.

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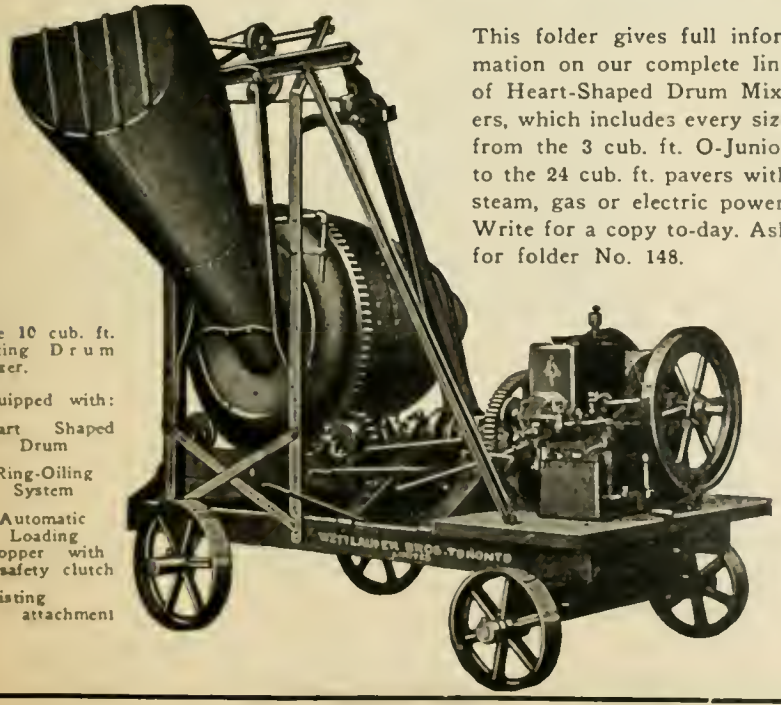
Information and prices gladly furnished on request.

HOISTS
CRUSHERS
BLOCK MACHINES

WETTLAUFER
CONCRETE MACHINERY
AND CONTRACTOR'S EQUIPMENT

Write for List of SECOND-HAND EQUIPMENT

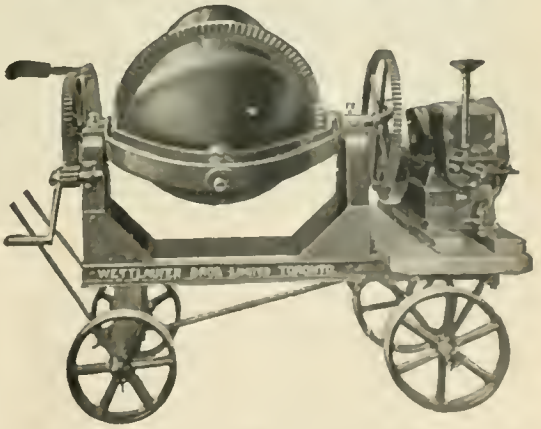
Just Issued—A New Folder on Tilting Drum Mixers



The 10 cub. ft. Tilting Drum Mixer.

Equipped with:
Heart Shaped Drum
Ring-Oiling System
Automatic Loading Hopper with safety clutch
Hoisting attachment

This folder gives full information on our complete line of Heart-Shaped Drum Mixers, which includes every size from the 3 cub. ft. O-Junior to the 24 cub. ft. pavers with steam, gas or electric power. Write for a copy to-day. Ask for folder No. 148.



The famous O-Junior Mixer—a combination mixer for cement, mortar, plaster, etc. The handiest and most popular light mixer in Canada.

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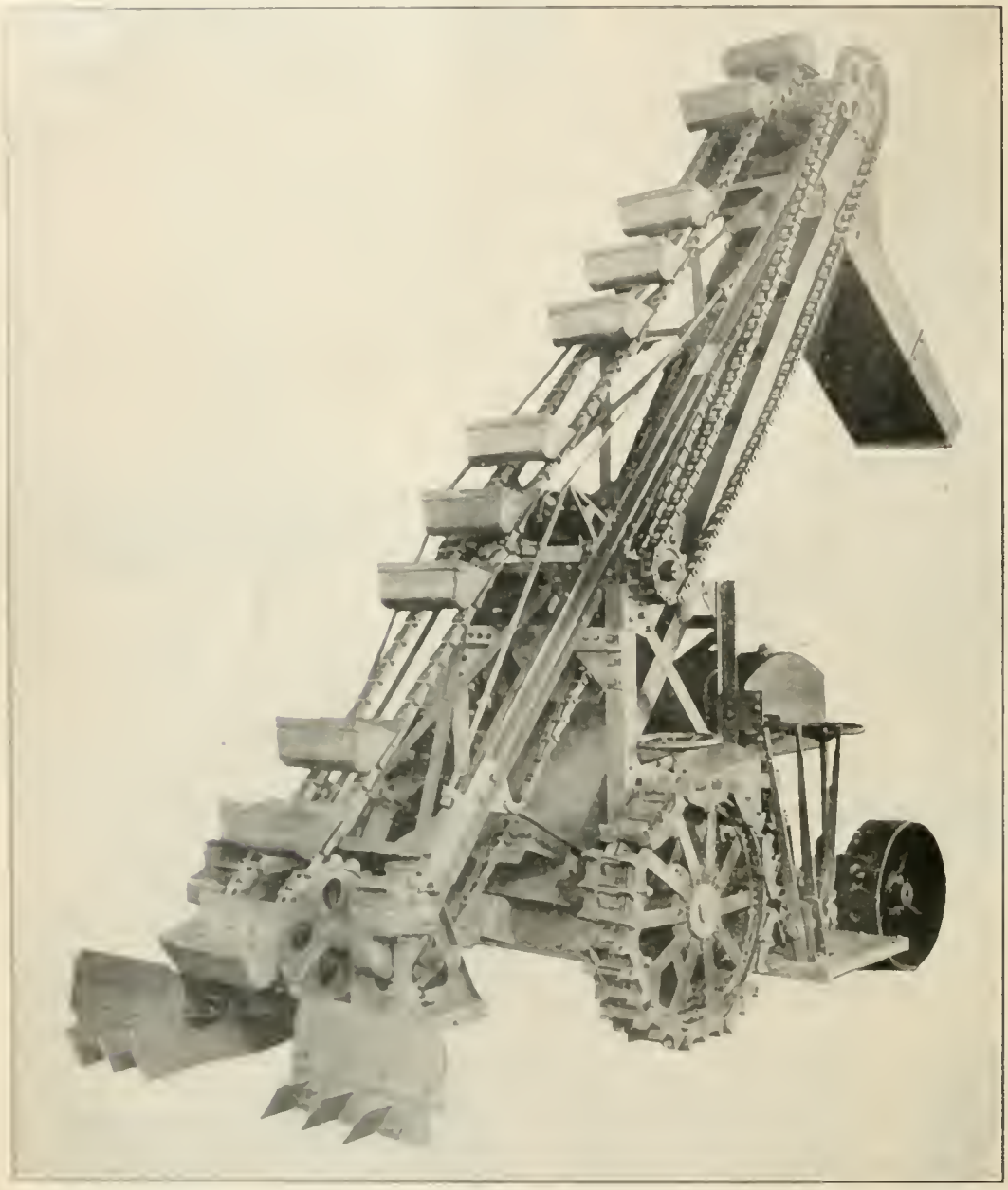
AUSTIN WAGON LOADERS



AUSTIN GRIP-WHEEL LOADER

AUSTIN "MOVES THE EARTH—MIXES THE CONCRETE"

Austin Features

RUGGED CONSTRUCTION

POSITIVE ACTION

LARGE CAPACITY

FAST OPERATION

LOW UPKEEP

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AUSTIN "MOVES THE EARTH—MIXES THE CONCRETE"

AUSTIN LOADERS can be supplied with all multipedal traction, plain wheels, or Grip Wheels as illustrated. All are one man machines and all are equipped with the famous Austin Feeding Device, the most positive known.

AUSTIN LOADERS have a very large capacity, from 1 to 1½ cu. yds. per minute with a digging width of 7 ft. and a discharge height of 9 ft. 2 in.

AUSTIN LOADERS will handle loose bulk materials such as crushed stone, gravel, sand, coal, etc., at a fraction of the cost of hand work. Write for descriptive literature.

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Take foundation digging, or ditching, for instance. Your Keystone, fitted with a Ditcher Scoop and running all day with a crew of only three men, will throw out around 300 cubic yards per day, handling practically any kind of soil, at a pace that will keep the dump wagons hustling.

And they can hustle because both they and the Keystone can stay on the level.

The Keystone can travel under its own power practically anywhere a dump wagon can go, yet its weight, 12 tons, isn't enough to break pavements or strain bridges.

The Keystone, being made in Canada, costs surprisingly little to buy, too!

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Boom and stick with Ditcher Scoop reach out 26 feet and dig down with efficiency to 16 feet.

A 32 h.p. pull yanks the Ditcher Scoop up through any kind of material, ⅝ cu. yds. at a time.

When full the boom swings round over the dump wagon when the drop bottom of the Scoop deposits the material with absolute accuracy

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ALPHABETICAL LIST OF ADVERTISERS

Eric Steam Shovel ... 19
Excelsior Artificial Stone Co. ... 68

Fate Root Heath Co. ... 81
Federal Motor Truck Co. ... 61
Fidelity Agency of Canada ... 60
Fuller & Johnson Mfg. Co. ...

Galt Stove & Furnace Co. ...
Gartshore, John J. ... 81
Gartshore Thompson Pipe & Foundry Co. ... 86
General Products Limited ... 69
Goldie & McCulloch Co. ...
Gore, Nasmith & Storrie ... 70
Grant Contracting Co. ... 73
Greening Wire Co., B. ...

Hagersville Crushed Stone Co. ... 75
Hagersville Quarries Ltd. ... 77
Hamilton Bridge Works Co. Ltd. ...
Hamilton Gear & Machine Co. ...
Harbor Brick Co. ... 76
Hardware Co., of Toronto ...
Heltzel Steel Form Co. ...
Hepburn, John T. ... 83
Hodge Marble Co. ... 69
Hopkins & Co. Ltd., F. H. ... 88
Hunt & Co., Robert W. ... 85
Hydro Salvage Syndicate ... 66
Hynes, W. J. ... 69

Ideal Fence & Spring Co. ...
Imperial Oil Co. ...
Industrial Works ... 71
Inglis Co., John ...
International Business Machines ... 86
Inventions Limited ... 64
Italian Mosaic & Tile Co. Ltd. ... 68

Jack & Co. Ltd., Watson ...
James, Proctor & Redfern ... 70
Jamieson Lime Co. ... 81
Jeffrey Mfg. Co. ...
Jenkins Bros. ... 27

Kerr Engine Co., Ltd. ... 84
Kilmer & Barber ... 85
King Construction Co. ... 68
Koehring Co., of Canada ... 4

Laurie & Lamb ...
Lea, R. S. & W. S. ... 70
Leckie Co., John ... 87
Le Roi Company ... 9
Lincoln Electric Co. ...
London Concrete Machinery Co. ... 3
Lumsden Engineering & Transport Company Limited ...
Luxfer Prism Co. Ltd. ...

Mack Trucks ...
MacKinnon Steel Co. ...
MacLean Building Reports ...
Melville Quarry Co. ...
McAuliffe Co., W. J. ... 85
McAvity & Sons, T. ... 73
MacFarlane Douglas Co. ... 68
McGovern, T. J. ...
McGregor & McIntyre ... 80
McLeod Ltd., Norman ... 68
Miller & Sons, Roger ... 85
Milton Hersey Co. ... 70
Minogue Trucking Co., Ltd. ... 69
Mueller Mfg. Co., H. ...
Muldoon Ltd., J. ...
Mussens, Ltd. ... 21-22-23

National Conduit Co. ... 81
National Fireproofing Co. ...
National Iron Corporation Ltd. ... 81
Neptune Meter Co. ... 71

Oakley, Geo. & Son, Ltd. ... 75
Ormsby Co. Ltd., A. B. ...
Ontario Gypsum Co. ...
Orton & Steinbrenner ... 83
Osgood Company ... 79
Otis Fensom Elevator Co. ...

Pacific Coast Pipe Co. ... 79
Packard-Ontario Motor Co. ...
Page Hersey Tubes Ltd. ...
Pannill Door Co. ... 69
Paris Sand & Gravel Co. ... 75
Patterson Construction Co. ... 68
Patterson Electric Co. ... 68
Pawling & Harnischfeger Co. ...
Pedlar People ...
Prack, Bernard H. ... 70
Preston Woodworking Machinery Co. ... 59
Provincial Contracting Co. ...

Queenston Quarries Co. ... 76
Quinlan & Co., John ... 68

Reid & Brown Structural Steel & Iron Company ... 70
Rigg Cut Stone Co. ... 69
Rilett Bros. ...
Rogers Supply Co. ...
Rogers, W. H. ... 69
Russell Construction Co. Ltd John E. ... 12

Sanderson-Cyclone Drill Co. ...
Santo, Chas. E. ...
Sarnia Bridge Co. ... 74
Sauerman Bros. ... 83
Sawyer-Massey Co. ...
Scriven Construction Co. ... 68
Seymour, H. L. ... 70
Sloan Valve Co. ... 1
Smart-Turner Machine Co. ...
Smith Marble & Construction Co. ... 69
Spielman Agencies Limited ... 5
Standard Steel Construction Co. ... 80
Standard Lime Co. ... 76
Standard Underground Cable Co. of Canada Limited ... 79
Sterling Engine Co. ... 87
Stewart Ltd., Robt. ... 82
Stockland Road Machinery Co. ...
Structural Steel Ass'n ...
Sturtevant & Co., B. F. ... 62
Summerhays, Wm. ... 70
Symmes & Co., H. H. ... 69

Thew Shovel Co. ...
Thompson Bros. ... 70
Thwaites-Hewitt Co. ... 68
Toronto Asphalt Roofing Mfg. Co.
Toronto Brick Co. ...
Turbine Sewer Machine Co. ... 79
Turnbull & Co. Harvard ... 13
Turnbull Elevator Co. ...

United States Fidelity & Guaranty Company ... 60

Vancouver Wood Pipe & Tank Co. 86
Vitrified Clay Pipe Publicity Bureau

Wilson, J. M. ... 71
Warren Bituminous Paving Co. ... 17
Waterous Engine Works Co. ... 28
Webb & Son, E. ... 70
Webster & Trory ... 70
Western Steel Products ... 26
Western Waterproofing Co. ... 69
Wettlaufer Bros. ... 13
Wheatley, James ... 69
Witchall & Son ... 24-68
Wood Hydraulic Hoist & Body Co., Limited ...
Worthington, W. R. ... 70
Wynne-Roberts & Son, R. O. ... 70

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PAVEMENT

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Warrenite-Bitulithic—

"The Best by Every Test"

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The Trail Blazers

"Ingersoll-Rand" Portable Compressors and "Jackhamers"

In the mountains and in rocky country Ingersoll-Rand Portable Compressors and "Jackhamers" are the modern trail blazers each playing its part in making "a neighborhood of the nation"—through the medium of good roads.

When Provincial Highway Commissions, railways and scores of contractors rely on Ingersoll-Rand Portable Equipment for this class of work they must have dollars and cents reasons.

They have realized that stationary compressor installations involve too many long, leaky and inefficient air lines. The compressor should move with the work—be as portable as the "Jackhamer" drills.

"Ingersoll-Rand" Portable Compressors have largely replaced unwieldy permanent installations. Compressor, driven by tractor type gasoline engine (or electric motor) air receiver, fuel tank, radiator cooling system and accessories, are all mounted on a sturdy steel frame. The complete self-contained plant can be drawn to the work by team, truck or tractor and compresses your air at the point of use.

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Canadian Ingersoll-Rand Company, Limited

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Ingersoll-Rand

Two of the three Eries owned by Albert Bros., Shawsville, Va.
The material on the 13 mile road job shown here classified as 95% rock.

"To be sure of steady service, buy an ERIE!"—you hear it everywhere

These are just a few examples of *hundreds* of letters written by ERIE owners:

"The Erie has fewer breakdowns than any other shovel made. In two years' operation I haven't spent $10 for repairs. The Erie gives us 400 to 500 cu. yds. per day in heavy grading, and it only takes us about 3 hours to change over to a crane and unload 6 to 10 cars of material per day."—**C. G. Fuller, Dover, Ohio.** (Own 2 Eries.)

"In 8 months, we have moved our caterpillar type Erie 70 miles, and it hasn't cost a nickel for repairs. During the past 10 years I have had experience with most makes of shovels. When I went into business for myself I bought an Erie, as I am convinced from practical experience that it is the best shovel to own."—**Fred. J. Hines, Pres., Hines-McCabe, Inc., Rochester, N.Y.**

"Our Eries have been excavating for buildings for more than 8 months, sometimes nearly all rock, and we have spent nothing for repairs. We get anywhere from 400 to 800 cu. yds. per day from each. I have run practically every known make of steam shovel, and I have not seen one that can compare with the Erie."—**E. W. Cronin, Cronin & Driscoll, Roxbury, Mass.** (Own 2 Eries.)

"The Erie cannot be compared to any other machine that I have seen or used. Before purchasing my Erie I owned another shovel which I had to sell because of its extremely high upkeep cost. Grading roads and digging sewers with my Erie for a year and a half, my repair cost has been only $9.00."—**C. A. Johnson, Virginia, Minn.**

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Type "B" Erie Crane loading stone, and sand from storage piles to measuring bins. Owned by Fort Pitt Construction Co., Pittsburgh, Pa.

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We will be glad to tell where there are Eries at work near you, so you can go and look them over. We will also send our Bulletin C-16, giving full description of the Erie Shovel, with many interesting photos of it on different kinds of work. Just write us.

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ERIE Revolving Shovels

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A Sign of Progress

When you see the tall bulk of a Canadian Des Moines Elevated Steel Water Tank rearing above the rest of the landscape in some busy little town or vilalge, note it as a sign of progress.

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CANADIAN TANKS DES MOINES TRADE MARK

CANADIAN DES MOINES

MUSSENS LIMITED

Windrows of scarified macadam and dirt are loaded with a Barber-Greene in Nashville, Tenn.

A Barber-Greene loading snow

Revolutionizing city paving methods

How the Barber-Greene Loader keeps down labor costs in summer—and replaces 60 snow shovelers in winter

LAST YEAR Nashville, Tennessee, removed the macadam from a certain street, and graded down the road bed an average of twelve inches in order to lay concrete pavement.

The scarified macadam and earth were plowed into windrows and a Barber-Greene Loader was put to work loading them into trucks.

In one day the Loader cleaned up 1,455 square yards of road by loading 485 cubic yards of material.

The average was 250 cubic yds. per day counting in the stops due to bad weather and the like.

The superintendent of the job writes: "We are revolutionizing city paving methods here by the use of this Loader. We have revamped our old ideas about the proper co-ordination of scarifier, scraper and trucks, and now we are the envy of contractors who have come to inspect our work."

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With the present scarcity and high cost of common labor, savings like these appeal strongly to municipalities in all parts of the country.

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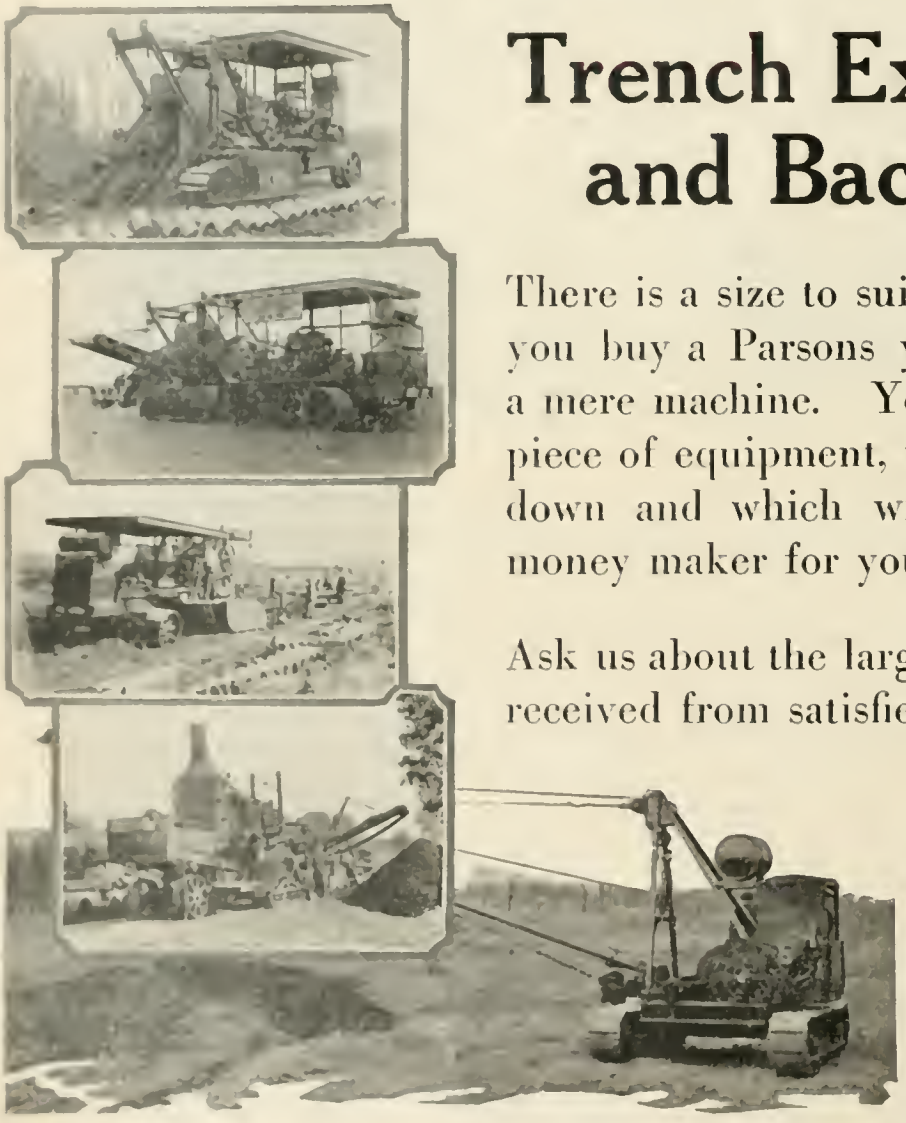

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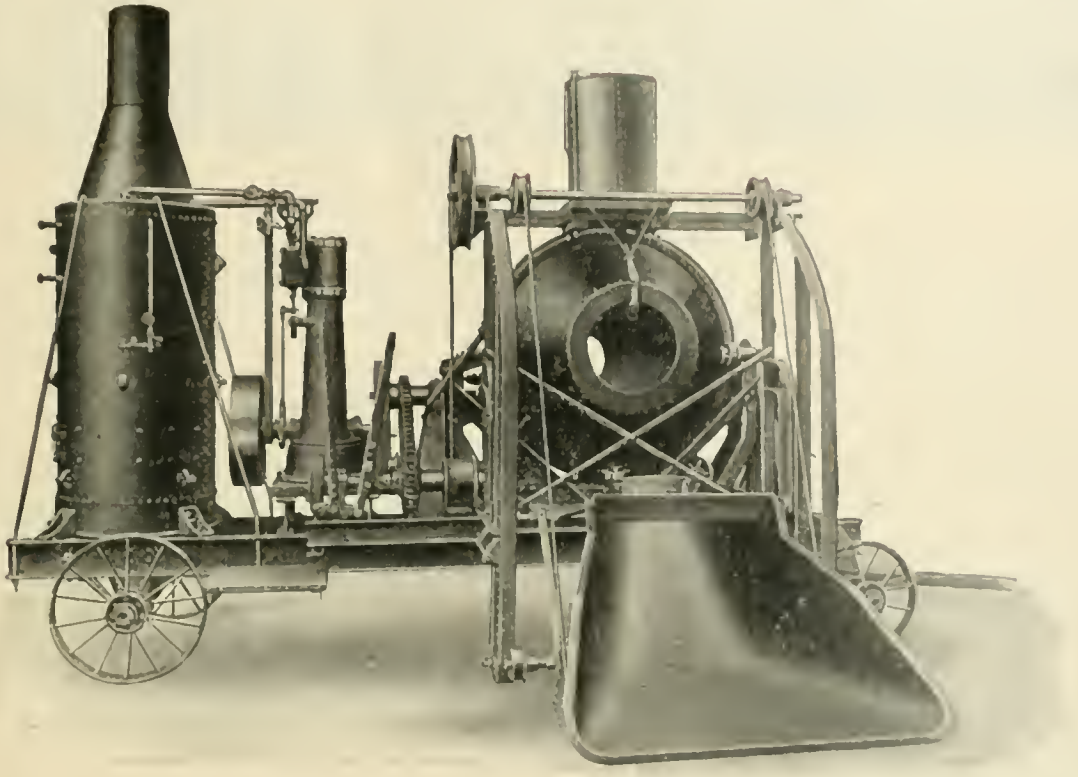

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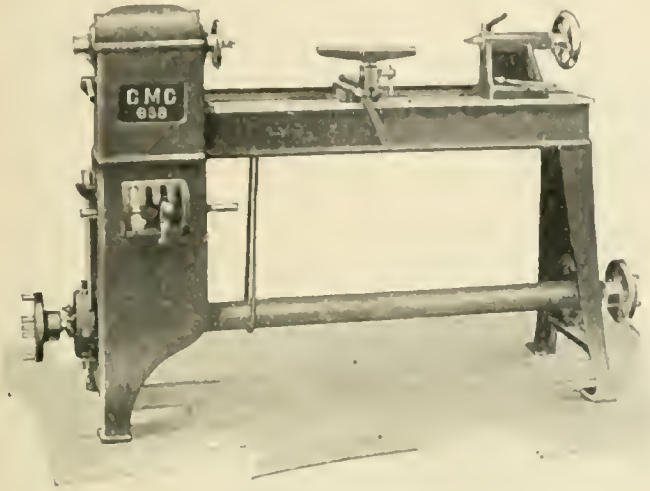

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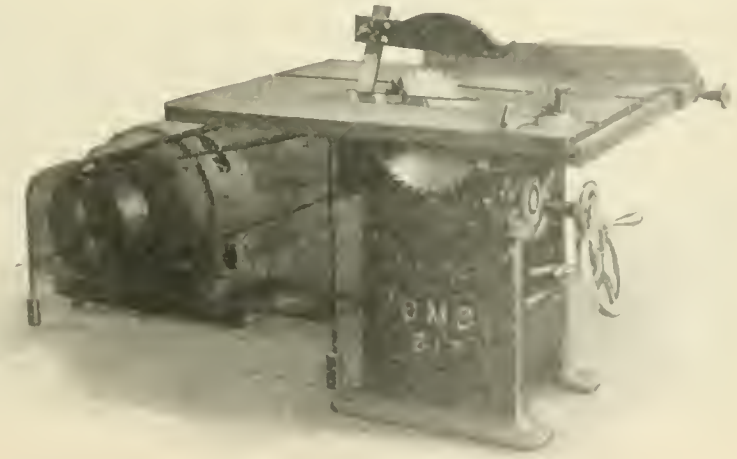

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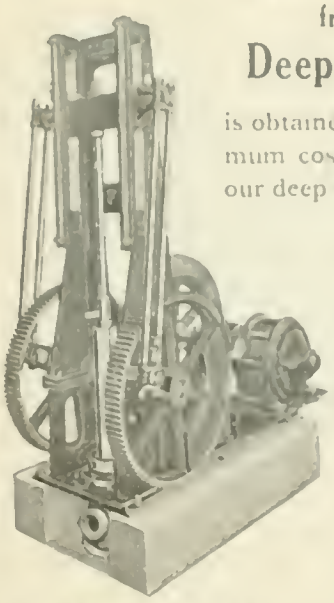

Write for Bulletin 20 explaining the use of Cook's Patent Brass Tube Well Strainer

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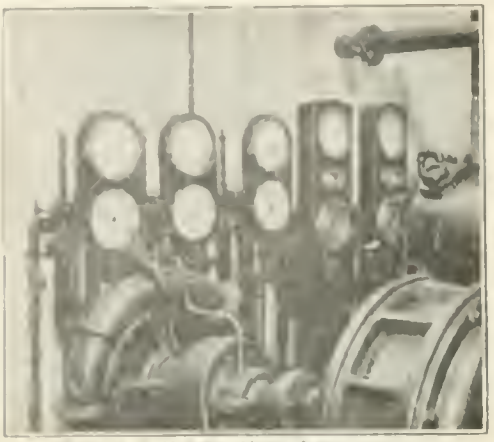

Venturi Meter Instruments at U.S. Stock Yards & Transit Co.

THE VENTURI METER SAYS WHEN TO CUT IN OR CUT OUT A PUMPING UNIT

The wide variation in demand for water during the 24 hours of a day at the U.S. Stock Yards & Transit Co., Chicago, requires a rather extensive array of pumping units. The installation consists of one 1,000,000 gallon, two 3,000,000 gallon and two 6,000,000 gallon centrifugal pumps, the discharge lines of which contain one 6 in., two 10 in. and two 18 in. Venturi Meter Tubes. The accompanying engraving, shows the five Venturi Meter Instruments which are located in the pumping station.

The readings on the indicator dials of these Venturi Meter Instruments tell the Engineer the proper combination of units to operate to most economically take care of the required pumpage. By careful attention to the Venturi Meter readings throughout the 24 hours, the pumps in service are varied from the single 1,000,000 gallon pump to the entire group of five units, the combination in service always being the most economical for the load.

The Venturi Instruments also made complete records of the discharge by each pump on a 12 in. circular chart covering a period of 24 hours.

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Tanks (welded or rivetted), Steel Pipe, Elevators, Conveyors of all kinds, Steel Stacks, Steel Buckets, Dumping Skips, Screens, etc.

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ESTABLISHED 1886

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Principal Contents

Editorial 617
Compressed Air in Construction Work 648
The Riverdale Technical School, Toronto 653
Are Odd and Short Lumber Lengths Desirable? 656
Steam Shovel Produces Saving of 174 Per Cent 657
Is Another Buyers' Strike Imminent? 658
Kiln Scum Face Bricks 661
What Manitoba Will Spend 661
New Timber Standards 662
Labor Saving Devices for Road Work 663
Hints for the Contractor 665
Mainly Constructional 670

Labor is Hanging Itself in a Noose of Its Own Making

Fortunately there has not yet developed in Canada that distressing situation in labor circles that seems to have paralyzed the construction industry in the United States. Perhaps it is because our building activity has been less impetuous and our labor somewhat saner. At any rate, we have much to be thankful for that a wholesale cessation of building operations has not developed in Canadian cities as it has in so many American centres. Mature reports that now come from the other side do not minimize at all the first rumors that appeared to be flushed with exaggeration. Indeed, as the facts become known it seems that the early news failed to even do justice to the seriousness of the situation.

Lately the United States press, popular and technical, has been full of comment on the developments that have taken place, indicating that the American mind is seriously concerned with the undesirable situation that has arisen. Indeed, so serious was the outlook a few weeks ago, that the American Construction Council urged a cessation of building and was supported in its efforts by other public and contracting bodies like the Associated General Contractors of America. When organizations like these whose functional purpose is the promotion of building, actually urge a retardation, there must surely be something seriously wrong in the industry.

* * *

From all reports bearing on the situation, it appears that labor must in large measure take the blame. At any rate it is almost superfluous to ask how long building can continue when mechanics are asking $25 or more per day—it cannot go on, that is all there is to it. And yet that is precisely what some classes of labor are attempting to get. The "Wall Street Journal," for example, reports that as high as $25 is being paid to members of the trowel trades in New York City, while in some Long Island towns, plasterers recently went on strike for $27 a day with double time for overtime. "Instances are known," states this authority, "where plasterers' pay has run to $250 a week." Possibly wages are higher in the vicinity of New York City than elsewhere in the United States but it seems that demands of the same calibre are being made in other centres.

When it is remembered that labor forms a very large part of the cost of construction, the seriousness of the situation is apparent. The exhorbitant demands of labor could produce no other result than that which did develop—a cessation of building; in other words, a buyers' strike. It was to forestall anything of this character that several months ago the Associated General Contractors were led to plead with the unions and building supply manufacturers and dealers to keep their prices down. When it was evident that costs were mounting in spite of protests they went even further and urged a reduction in the amount of building, believing that such a policy would avoid the crash that would inevitably follow high costs and that would reduce the industry to a state of depression from which it would be long in recovering. Apparently, this advice has been heeded, for all over the United States, building has halted to a point where it will pay labor to reconsider their demands and take wages in accord with their true worth.

* * *

In Canada, things have not reached this pass, but lest they do it would be wise to take to heart the lessons which are presented to us by the situation that has developed on the other side. So far this year building has increased to a degree that makes us very optimistic. With costs at a sane level, this condition promises to continue throughout the season, but should any untoward increase in cost take place it is to be feared that a buyers' strike of somewhat dire possibilities may puncture the boom. It is a matter that is largely up to labor. It is to be hoped that they will be alive to the duty that is expected of them.

Compressd Air in Construction Work

Recent Developments in the Use of Pneumatic Machinery

The First of a Series of Articles Indicating How Compressed Air Can be of Great Service to the Contractor—An Indispensable Agent that Saves Time and Money

By F. A. McLEAN

Portable compressed air operated equipment, has made the large construction project of a few years ago the short time job of today. The value of compressed air on large construction jobs has long been realized but until the advent of a reliable and truly portable compressed air plant, the cost of erecting, tearing down and moving a compressor plant prohibited its use for the hundred and one small jobs that require from a few minutes to a few days to do. With compressor plant and tools as portable as a carpenter tool box there is practically no job that is now too small to use compressed air to advantage.

Compressed air operated tools, driven by air from a portable or semi portable compressor have proved great labor savers in road work, excavations, trench and tunnel digging, pipe calking, backfill-tamping and all similar work. These air operated tools will do the work of from three to ten men, thus reducing costs, increasing the output per man and to a certain extent add to the contractors working season, by permitting work in frozen ground and by cutting down on the number of men who have to be "spelled"

Pneumatic clay diggers working on a sewer tunnel heading

in cold weather. Modern air compressors, for operating these tools have been developed, so that compressed air can easily be secured for any job.

Pneumatic Diggers for Foundation, Trench, Shaft, Tunnel and Similar Excavations

Notable progress has recently been made in excavation work through clay and hard ground by the use of pneumatic clay diggers. These air tools were developed to take the place of the ordinary hand pick and enable the work to be carried on at a faster rate with materially reduced costs. Incidentally, they probably represent the first real improvement of the hand pick made in several thousand years.

The pneumatic clay digger makes rapid progress in wet, sticky ground or in hard dirt where hand picks are of little use

Excavation in stiff clay and hard ground, where power shovels, trenching machines, etc., cannot be used, is usually slow and expensive if the material has to be loosened for removal by hand picking. On many jobs the ground is not hard enough to be drilled and shot and yet is too hard to be removed with the ordinary hand shovel alone.

Clay diggers have been found very advantageous for such jobs. They have proved remarkable labor savers making it possible for each man to do as much work as five men with ordinary hand picks.

Machine Versus Hand "Picking"

In ordinary ground by the pick and shovel method, one shoveler serves one man with a pick. Using a pneumatic clay digger one man will loosen enough ground to keep at least five shovelers busy. In other words, the man with the air tool will do as much work as five men with hand picks. The rate will even average higher than this because the man with the pneumatic digger keeps up a uniform rate of work with fewer stops for rest, as the work is less tiring than swinging a hand pick.

An actual comparison between two sections of trench, in one of which hand picks were used, while

m the other these pneumatic diggers were employed, gave the following result:

Hand Picking—10 men working 8 hrs. each loosened 61 cubic yards of clay per day. Average rate per man per day, 6½ cubic yards.

Pneumatic Picking—5 men working 7 hrs. each loosened 157 cubic yards of clay per day. Average rate per man per day, 31 cubic yards.

The above figures are taken from actual records

Pneumatic clay digger starting an excavation job. The paving breaker in the background is used for heavier work

made by a large public service company using a total of fourteen of these machines. The work on which they were employed was trench digging preliminary to the laying of a 20-inch gas main. The soil encountered in excavating the trench was clay and hard sand interspersed with many boulders, very often of large size, and occurring so frequently that trenching machines would not have been at all satisfactory.

Another important application of pneumatic clay diggers in an Eastern city on an excavation for a street car tunnel showed similar savings. A dozen

Clay digger and motor driven loader on excavation work. One man with clay digger keeps five shovellers busy filling loader

pneumatic clay diggers were used to replace all hand picking and with very gratifying results. It was found that the pneumatic diggers easily increased the work of the men five times and even six or seven times as compared to the [illegible] with the hand picks.

Contractors report that their men find the [illegible] very easy to operate because they can stand [illegible] nearly upright position to operate while working. Also that the danger of accident to other workmen from careless swinging of the hand pick has been eliminated and that more men can be put at a given place to shovel out the loosened material, with greater safety.

Construction of Extension Handle Type Clay Digger or Pick

This tool for trench work, excavations, shaft sinking, open cuts, etc., is, briefly, an air hammer with cross-bar extension handle of suitable length. A digging blade is held in the nozzle end of the hammer by a retaining device, which also permits the blade being easily removed if so desired.

In operation the blows of the hammer drive the blade into the clay or hard ground so that it is pried loose.

The throttle, which controls the operation of the tool, is conveniently located in the grip handle so that the operator almost automatically shuts off the

For excavation work the extension handle type of clay digger is generally used

air as the tool is lifted from one position to another. A buffer inside the retaining nozzle takes up the blow of the hammer if the tool should be run while being lifted.

For clay the blades are approximately "6 x 8" and of a slight scoop shape and are usually called "clay scoops." For earth they are "5 x 9," rectangular in shape, with a flat face ⅝" thick at the top and 5/16" thick at the bottom with the cutting edge beveled from the back. These are known as "flat picks."

The severe work and rough handling of the ordinary operator require a tool able to stand lots of abuse. The pneumatic clay digger must therefore be built to meet such conditions.

Clay Diggers in Tunnel Work

Pneumatic clay diggers as furnished for tunnel work are similar to those used for trench digging

Machine versus Hand Methods in Tunnel Work

Results obtained by tunnel contractors using pneumatic clay diggers show that the amount of work done per man has been increased from 100% to 180% over that accomplished where the hand pick was used.

In tunnel work through clay one man was able to excavate from 4 to 6 cubic yards of clay per shift of eight hours with a hand pick. With a pneumatic clay digger the same man would loosen from 8½ to 11 cubic yards in the same length of time. On the basis of this labor saving and speeding up of the work, practically every Detroit contractor doing sewer tunnel work has used pneumatic clay diggers, claiming that they cut the cost of doing the work at least 30%. The work there has been mostly done through ground varying from a very soft pumice-like clay to a very hard clay with pockets of sand.

Results obtained in a Detroit sewer tunnel, 10'-6" in diameter. Average soil encountered, very hard clay. Six pneumatic clay diggers used to the heading. Average rate per man, 11 cubic yards per shift. The best rate attained without using the air tools, 5 to 6 cubic yards per man per day. Under the most favorable conditions on this job a rate of 16 cubic yards per man per day was reached at times.

A comparison between hand and machine methods on the above job shows the following results:

Hand method of picking—Six men with hand picks working 8 hrs. per day handled 30 cubic yards per day. Average rate per man, 5 cubic yards per day.

Pneumatic picking—Six men with clay diggers working 8 hrs. per day handled 60 cubic yards per day. Average rate per man, 11 cubic yards per day.

Paving breakers operated by portable compressor on a Montreal street. These tools are also used for tearing up hard macadam, etc.

The increase in working rate with pneumatic clay diggers was 6 cubic yards per man per day.

Another tunnel of 9' diameter nearby furnished the following records: Soil, mostly medium hard blue clay. Four pneumatic clay diggers used in heading. Average rate of progress per day, 17' of tunnel. Average rate per man, per day of 8 hrs., 10 cubic yards. The clay on this job held up very good, no bracing or timbering being needed to hold up the roof.

Comparison of progress with two methods of picking:

Hand Methods—4 men with hand picks working

In addition to tearing up concrete pavement the paving breaker is also used on demolition work of various kinds.

Public service companies find the pneumatic paving breaker useful for manhole excavations in city streets

8 hrs. per day excavated 21 cubic yards per day. Average rate per man, 5¼ cubic yards per day.

Pneumatic Method—4 men with pneumatic clay diggers working 8 hrs. per day excavated 40 cubic yards per day. Average rate per man, 10 cubic yards per day.

Increase in working rate per man, 4¾ cubic yards per day.

On still another sewer tunnel job in the same district, with diameter of 14', the progress was approximately 12' of tunnel per day. Four men with pneumatic clay diggers, four muckers, and one car man were used. The conditions on this job were ideal but the rate attained shows what fine results the pneumatic digger has made possible.

Pavement Breaking and Demolition Work

Many contractors consider it an unnecessary expense to cut asphalt or bitulithic pavement with pick or chisel and sledge, or break up concrete by

A pick and shovel could hardly make a trench as even and as easily repaired as the above, which was the work of a pavement breaker

hand. Not only is the hand method laborious but it is wasteful in that quite often the opening created is larger than occasion requires as it is almost impossible to take out accurate strips to open a trench for laying pipe or conduits.

Until lately all of this work has been done by hand, but now many companies have installed air pneumatic paving breakers. By doing this they have reduced the cost and time of this work greatly. One record shows a cost saving of about 67% and a time saving of about 75% more using machine instead of hand methods.

In addition to their principal application the "Paving Breakers" have been found very successful for tearing out brick, concrete foundations, retaining walls, culverts, factory floors, etc. Some of the accompanying photos show these machines in use.

Machine Versus Hand Method

A very good crew of eight men using hand methods will cut about 80 linear feet of 18" to 21" asphalt and concrete in an eight hour day. The asphalt averages 3" to 6" in thickness and the concrete 6". That means 10' per man per day, or 50 cents per linear foot at a $5.00 wage. Three men with a portable compressor and two pneumatic tools cut an average of 300 linear feet per day. This costs about 10 cents per linear foot when wages, operating cost, interest, depreciation, etc., are all taken into consideration. That means a saving of two-thirds

On this job in London, six paving breakers broke up 2200 sq. ft. of concrete, 10 in. thick, in two days

in cost and the work is done in about one quarter of the time.

The above figures are not estimated. They were furnished by a large public service company which uses four of the above mentioned outfits. They say that each outfit pays for itself every month and their statement is backed up by figures.

These machines afford another saving which appeals to this company. It pays its men who are on this work whether it rains or shines, yet it does not expect the men to work on rainy days. One of the officials stated that the paving breaker saves them $75.00 every day it rains, because if they were using the old hand method, there would be a team idle men around the shops.

Rock Excavation, Breaking Up Boulders, Etc.

Since the days when the only preparation needed for a piece of construction work was the assignment of as many husky laborers as could be found and the provision of the simplest of tools—picks and shovels, drill steel and sledge, wheel barrows, etc.—things

For doing a narrow trenches the Jackhamer type of tool has practically superseded the heavy piston drill

A radically different problem was offered in the making of a deep rock cut to lower the grade of a city street. The contractor first employed piston drills and later changed over to Jackhamers with the following result:

	Piston Type	Jackhamer
Number of drills	3	3
Number of drill operators	3	3
Number of helpers	3	0
Kind of rock	altered gneiss	
Average depth of holes	18.25 feet	
Daily drill hole footage per drill	50 feet	120 feet

While ordinarily operated from an independent air plant it is quite common for steam shovel operators to run a Jackhamer on steam from the shovel boiler or on air from an auxiliary compressor mounted on the shovel.

A contractor, who was working in stiff clay full of boulders, equipped each of his steam shovels with two steam Jackhamers. He estimates his subsequent drilling cost at a trifle over one cent per foot and figures he is saving a lot of money. He says—"By drilling a boulder a half-stick of powder will break it, while mudcapping requires five or six sticks. I would not call a shovel outfit complete without one of these small drills."

The exceptional jobs for which hand hammer drills are not recommended are submarine drilling, badly broken ground or very deep cuts, heavy excavation projects which can be more economically handled by tripod or tower mounted piston drills, capable of drilling very deep holes of comparatively large diameter. This drilling method permits the employment of extra heavy powder charges and the breaking of great yardage at a single blast. Notable examples of this class of work in Canada are the recently completed Chippawa Canal and the new Welland Canal, now under construction. The deep hole machines used on these jobs will drill a 5" hole to a depth of 60 feet or more.

(To be continued)

Now a Member of the Legislature

Mr. Geo. Oakley, of Geo. Oakley and Son, Ltd., stone contractors, Toronto, who was elected last week to the Ontario legislature, representing Riverdale

The new technical school on Greenwood Avenue, Toronto

The Riverdale Technical School, Toronto

A New Educational Institution Serving the Technical Training Requirements of the East End of the City—A Fireproof Building of Pleasing Design—Splendidly Equipped

Technical training is now recognized as so important an element in the education of boys and girls that special buildings and equipment have had to be set apart in important centres for the purpose of providing that type of scholastic teaching. In Canada, the Dominion government has sensed the requirements in this direction and is consequently aiding the provinces with their technical school programs. The result has been that in recent years the facilities for training the youth in the trades have grown very rapidly. In Toronto, for example, the Central School, built a few years ago, has become inadequate to meet the needs of the city as it has expanded and consequently other schools were planned. The first of these is the Riverdale technical school, serving the east end of the city. This building is just nearing completion and will be one of the most fully equipped educational institutions of its kind in the province, fully capable of giving its students a thorough training in the essentials of the technical arts and trades. A brief description of the new building follows:

The exterior was designed in a Gothic style which readily lends itself to large windows which are essential to classrooms. There are three large entrance doors, above which is a stone panel of Gothic design. Dignified steps lead to the main entrance. These steps are of dressed Indiana limestone.

The base of the building up to the level of the first floor is in Credit Valley random ashlar surmounted by a water table of Indiana limestone. Above the water table the building is faced with warm buff rug brick, trimmed around the windows with dressed Indiana limestone.

Every effort was made to cheapen the building by eliminating as much stone as possible, large cornices and other expensive stone mouldings being used as little as possible. For the same reason brick was used instead of stone which, of course, would have given the building a much more handsome and monumental effect.

The towers are simple in design and raised just sufficiently above the building to break the skyline.

The foundations are carried on firm clay, the piers, which are of concrete or brick, resting on stepped concrete footings. A continuous footing supports all basement walls.

The floor construction is all reinforced concrete, making the building absolutely fireproof. In some places plain slabs are used, while in other gypsum block fillers are employed.

To provide for long spans in the assembly hall and gymnasium steel columns carrying a steel truss roof are used. Steel girders and beams carry the concrete floor of the auditorium.

The sash in the building are all metal.

There is one particular feature of the building which might be specially pointed out and that is the large shop section which is arranged in an unusual way. There is a large construction room with all the various shops surrounding it—an arrangement which, it is believed, will facilitate the work of the [illegible] and the putting together of the work in the construction room.

The corridors like the rest of the building are all of fireproof construction, surrounded by fireproof walls. The walls have a buff pressed brick dado to a height of 4 ft. The floor finish is concrete covered with battleship linoleum.

The classrooms have concrete floors covered with

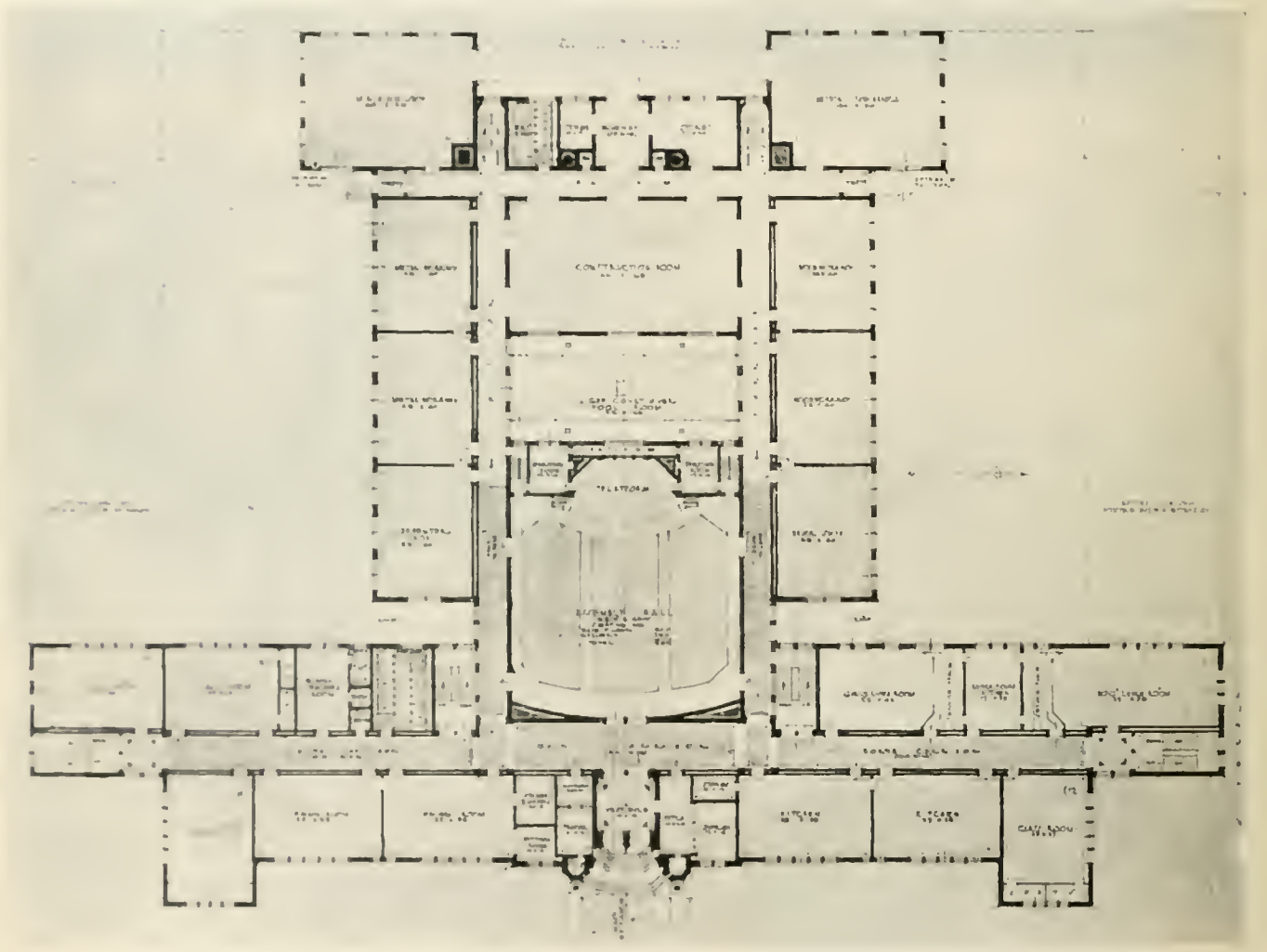
lavatories, quarry tile floors and marble lavatory partitions. All of the tile and marble are Canadian products.

The stairs are of concrete with iron railings and wooden hand rail.

The heating is of the vacuum system, tubular return boilers being used. The ventilation scheme has been very carefully figured so that each classroom is given six changes of fresh air per hour, all air being carefully waterwashed and humidified in the most up-to-date and modern fashion.

The roof is tar and gravel on 7/8-in. sheathing with galvanized iron flashings and drips. The copings on the fire walls are vitrified tile.

The electric wiring and equipment is of a high order and up to the standard demanded by technical



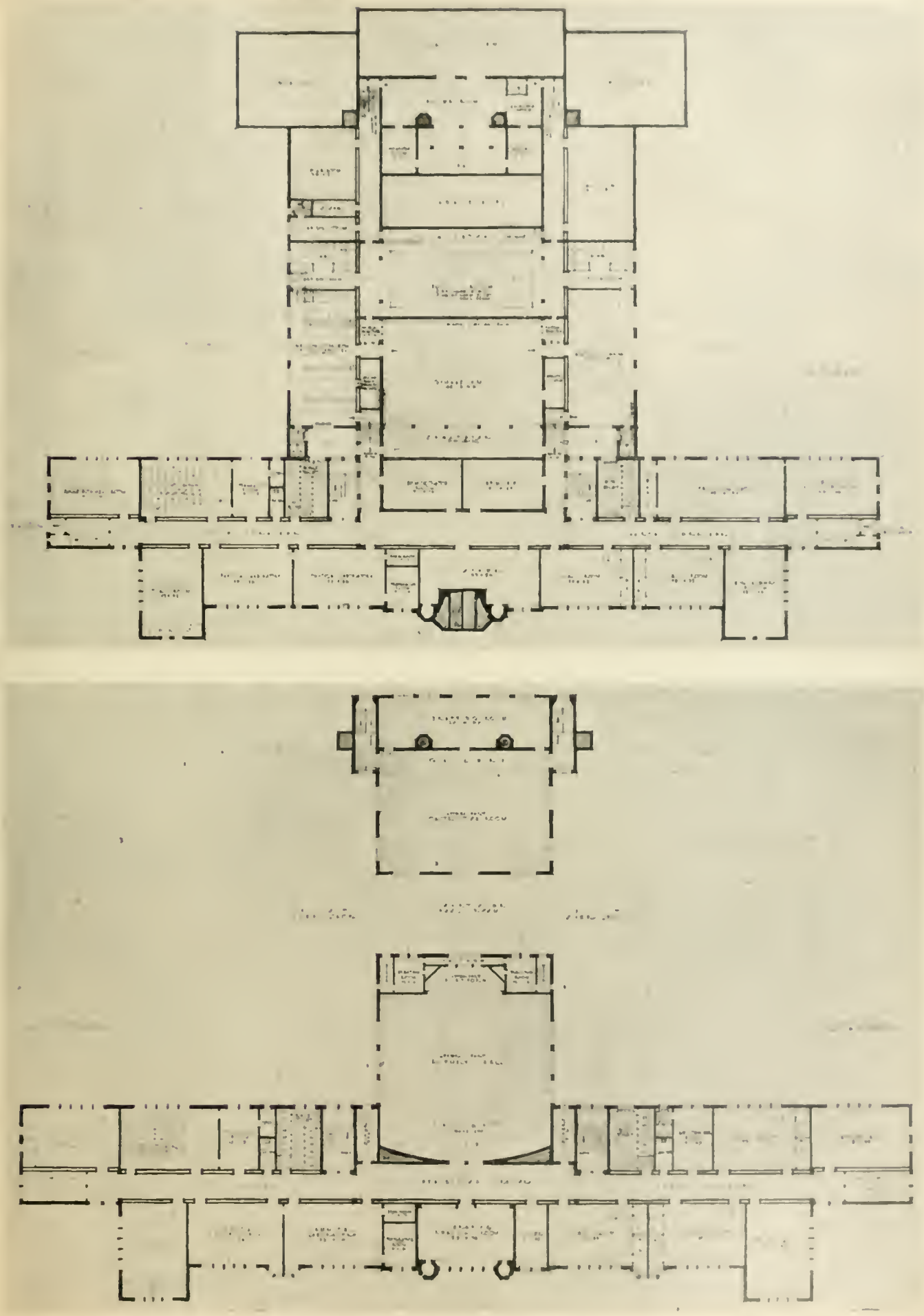
Plan of the main floor of the Riverdale Technical School, Toronto

schools. It was handled by the Canada Electric Co., Toronto.

The ornamental iron work was supplied by the Dennis Wire and Iron Works, London, Ont.

Provision is made for the extension of the building as the technical requirements of the district demand.

The Riverdale Technical school was designed by the architect's department of the Toronto Board of Education. The general contractor is Witchall and Son. Other contractors are: Mechanical trades, W. G. Edge, Ltd., electric, Canada Electric Co.; painting and glazing, Hughes and Co.; ornamental iron, Den-



Basement and second floor plans

roofing and sheet metal, W. E. Dillon Co., plastering and lathing, Andrew Petrie; marble and tile, Italian Mosaic and Tile Co.; structural steel, McGregor and McIntyre Limited; millwork, W. A. Mottatt Co., fire doors, Fireproof Door Co. The brick was supplied by the Don Valley Brick Works, Indiana limestone by Indiana Quarries Ltd. and Credit Valley stone by Frank Rogers and Co. Steel sash were furnished by the Architectural Bronze and Iron Works; wooden doors by T. H. Hancock.

The D. McKenzie Machinery Co., of Guelph, Ont., have the contract for supplying the metal-working machinery in the new Riverdale Technical School, Toronto. The woodworking machinery is being supplied by both the Canada Machinery Corporation, Galt, Ont., and the Preston Woodworking Machinery Co., Preston, Ont. All these machines, it is understood, are to be driven by individual motors.

The equipment will cost about $144,000, $72,000 being paid by the Government and $72,000 by the city.

The cost of the building without equipment is about $500,000.

Are Odd and Short Lumber Lengths Desirable?

Several Economies Would be Possible were Lengths of Lumber Manufactured Other than the Existing Standards—Some Interests Object to the Use of Unusual Sizes

Architects, contractors, builders and home-owners are probably not generally aware that the comprehensive and sweeping program for the national standardization of lumber which has been actively under way for more than a year, following several years of preliminary discussion, is nearing completion.

Without attempting to cover the whole field of progress that has been made to date by the Central Committee on Lumber Standards and the co-operating Consulting Committee on Lumber Standards, whose determinations affect Canada as well as the United States—it is important to note that standard widths and thicknesses for yard lumber tentatively have already been determined. This action is described as a distinct step in progress toward the establishing of sound and simplified national standards for the manufacture and sale of lumber. Another subject in which the building public is vitally interested is that of odd and short lengths of lumber. This important question is now under consideration by the Practical Size Investigating Committee—a subsidiary of the Consulting Committee.

Use of Odd and Short Lengths Would Produce Economies

In explanation of the meaning of odd and short lengths of lumber it should be said that standard sizes of lumber, following long established custom, are in even feet lengths, beginning with eight feet and running up as high as sixteen. Odd lengths are, of course, the intermediate lengths of 7, 9, 11, 13 and 15 feet. A varying amount of material is wasted in conforming to even lengths as, owing to defects and the taper of the log, odd lengths often result in the sawing but have to be cut off to meet standard size requirements. As for short lengths, it is plain for similar reasons that if the manufacturer makes no boards under eight feet in length much of the material is also wasted. In addition to the manufacturing wastes in both odd and short lengths it is notorious that there are huge carpentering wastes in cutting standard boards to meet building requirements where short lengths would be much more economical. It has been calculated roughly that the waste of good lumber material, because of the custom of not using odd and short lengths, is as much as ten or fifteen per cent. of the lumber content of the log. In these days of dwindling forest supplies such an item is well worth saving both from the consumer's economy point of view and the general conservation of forest resources.

According to the architects of the National Lumber Manufacturers Association the use of odd and short lengths of lumber of all kinds is a conservation measure in which all those who have at heart the best interests of timber conservation—lumber manufacturers, dealers and consumers—are concerned. Lumber manufacturers are practically interested in the inclusion of more odd and short lengths of lumber in shipments because this permits of more economical log utilization. It is apparent also that a larger proportion of odd and short lengths may suit the convenience, as well as the purse, of many consumers of lumber.

Marketing Difficulties

However, some wholesalers, retailers and consumers object to odd and short lengths. They urge that these lengths increase the cost of handling, necessitate larger storage space and more capital. Other reasons given for their opposition are that the inclusion of a large proportion of odd and short lengths in their stocks will increase overhead costs and result in a decreased turnover of stock. It seems, therefore, that the problem is not one primarily of manufacturing, but one of marketing.

If contractors, architects and consumers, generally, demand long and short lengths the dealers will naturally meet their requirements. It is, therefore, desirable to ascertain to what extent the builder can advantageously use odd and short lengths. The Practical Size Committee desires the co-operation of builders in determining to just what extent the public really does require odd and short lengths and the percentage of them that may be used in average construction as compared with the total amount used. All persons interested in this subject are urged to write to T. F. Laist, secretary of the Practical Size Investigating Committee, Conway Building, Chicago, Ill., and give their opinions and as much definite data as possible.

Mr. S. Antonini has opened a marble and tile business at Regina, Sask.

The Metal Shingle & Siding Company of Saskatchewan, Ltd., with offices at Saskatoon, has been dissolved.

Steam Shovel Produces Saving of 74 Per Cent

The Cost of a Heavy Excavation Handled by Four Power Shovels and Fifty Trucks is Estimated at $18,300—With Manual Labor it Would Have Cost $31,895

Some interesting figures are supplied by a cost study of a large excavating job in New York City—the removal of about 100,000 yds. of earth and rock from a pit measuring approximately 275 x 200 ft. and 50 ft. deep, to make way for the 22 storey building of the Equitable Life Insurance Co.

It was necessary to complete the excavation safely and with the greatest rapidity without obstructing the heavy traffic in the streets on three sides of the lot. The Thomas Crimmins Contracting Company, therefore, installed four steam shovels, a rock-drilling outfit, comprising 14 Jackhamer drills operated by air from four electrically driven compressors, and a fleet of fifty 5-ton motor trucks that handled the difficult work satisfactorily.

The shovels loaded the earth and loose stones directly into the motor trucks that entered the lot on a slope, from the foot of which they backed up to the shovels, received their loads of earth in from 1 to 4 min., and hauled them out of the pit without turning.

The movement of the trucks was well regulated, so that no congestion occurred, and there was very little waiting either by trucks or shovels.

After the removal of the earth and loose or rotten rock, the surface of the solid rock from 1 to 30 ft. below curb level was drilled. The holes, of a maximum depth of about 10 ft., were loaded with light charges of dynamite (protected by heavy wire and manila rope matresses and by chained timbers) and fired. The rock was shattered so that it could be handled by the shovels that loaded most of it into the trucks and into about 30 steel skips that in places not readily accessible to the shovels were operated by the long booms of derricks at street level, to load trucks in the street.

Careful cost figures were kept and for one of the shovels the direct average expense of operation per 8-hr. shift loading 5-ton trucks was:

Wages of shovel runner	$10.60
Wages of helper	6.76
½ ton soft coal	5.00
1 gallon oil	1.00
Water	2.00
	$25.36

The general expenses for the shovel were:

1 yoke bolt for dipper handle	$ 1.25
1 5/8 x 86 ft. hoist cable	15.00
1 set points for teeth	32.00
	$48.25

The cost of repairs was:

Cost of moving shovel 2 mi. and installing on job	$ 11.35	
Interest for 90 days on $7,570, value of shovel	113.54	
Depreciation, 6%	454.20	
General expense for 70.12 8-hr. shifts	$627.34	
General expense for 1 8-hr. shift	8.95	8.95
Total cost of operation for 1 8-hr. shift		$34.31

Steam Shovel Much Cheaper Than by Hand

At this rate, the cost of steam-shovel loading and excavating 127 loads (508 yd.) of earth in 8 hrs. was $34.31: equals $0.0675 + per yard, and for excavating and loading 14 loads (132 yd.) of stone in 8 hr. was $34.31; equals $0.26 per yard.

The total cost of steam shovel work for the entire job (which was not completed when these data were recorded, approved and verified) should therefore be estimated at:

40,000 yds. of earth excavation and loading at $0.0675	$ 2,700
60,000 yds. of shattered rock loading at $0.26	15,600
Total cost of excavating and unloading 100,000 yds. of earth and rock in deep city excavation	$18,300

The shovel in handling rock did the work of about 12 men and a derrick. In handling earth it replaced about 20 men digging and shoveling into the truck, or 15 men digging and shoveling into the skip or bucket on the ground handled by a derrick when the digging is easy. It also saved all drilling and blasting to shatter soft, loose and most kinds of hard earth.

If the steam-shovel work had been done by hand, with labor at $6 for 8 hr., as actually paid in New York, the cost would have been 20 x 6=$120 per 8-hr. shift for earthwork which cost $34.31 by steam shovel, or 3.49 times as much. The cost of the rock work, exclusive of cost of derrick service and increased cost of blasting and sledging, which would have been a material amount, would have been 15 x 6=$90 for 8-hr. shift that would have cost $34.31 by steam shovel, or 2.62 times as much.

If the whole job had been done by hand instead of by steam shovel the cost would have been:

$ 2,700 x 3.49=$ 9,323—cost of 40,000 yds. earth
15,600 x 2.62= 40,872—cost of 60,000 yds. rock

Total cost of hand excavation and loading	$50,195
Total cost of steam shovel excavation and loading	18,300
Saving by use of steam shovels for 100,000 yds. excavation and loading	$31,895=174%

An Increasing Demand for Bricks in the Old Country

F. W. Field, H. M. Trade Commissioner at Toronto, has made the following statement concerning the brick market in Great Britain, based on information which he has received from the Department of Overseas Trade in London: "The demand for bricks continues to improve, although the improvement is more pronounced in some parts of the country than others. In the south and south-eastern districts, makers are readily disposing of practically the whole of their production. Fletton bricks are also reported to be in brisk demand. There is certainly much increased activity in the building trade, and it is only reasonable to expect that the improvement will spread eventually to other parts of the country. It is expected that house building will be more extensively carried out a little later on, and this should turn the tide so far as the brick trade is concerned. Engineering bricks should also shortly be in greater demand as quite a lot of work which will necessitate the using of this class of brick is being contemplated.

Is Another "Buyers' Strike" Imminent?

Reports indicate that such a situation has already developed in the United States, attributable to the skyward tendency of building costs. For this upward trend of prices and for the cessation of construction operations consequent upon it, labor is regarded as being largely responsible. While Canada so far has not been so seriously affected as our neighboring country, nevertheless contractors are seriously concerned. For this reason this article is intensely interesting and illuminating. It has been compiled from various authorities by "The Industrial Digest."

When you are dining at the Ritz, and notice that the tired gentleman at the next table is a little unfamiliar with the clubs used in playing the nine-course dinner, do not hasten to conclude that he is a prospector recently returned from the Labrador gold fields. He may not even be the retired cattleman that he resembles. More than likely he is the bricklayer who helped to build the apartment that is going up next door.

For today there is no such thing as common labor. If you are a contractor you know the bitter truth of these words. If you are not, harken to the writer in the "Wall Street Journal," who says that labor in the building trades is now receiving the highest wages in history:

"While the union wage scale varies between $9 and $10 a day for the various trades, the actual minimum paid is $12, the ruling rate being $14 to $16 a day (in New York City).

"As high as $25 is reported as being paid to members of the trowel trades in the environs of New York City. In some Long Island towns plasterers recently went on strike for $27 a day. Double time is also demanded for overtime. Instances are known where plasterers' pay has run to $250 a week."

This same condition exists, though in varying degree, in every section of the country. Wages on the average are approximately 155 per cent. above the 1913 level. This figure is estimated on an average $14-a-day wage in the New York district—a fair figure according to contractors' reports. According to "Boston News Bureau," building trade labor is only 55 per cent. as efficient today as in 1913.

"Decreased efficiency is ascribed to various causes. During the war period requirements for admission to the labor ranks were not severe, due to the lower caliber of men then available. Another reason is the psychological reaction of the laboring man under improved conditions. It is a matter of economic history that every wage increase has occurred at a time of booming business, and has been followed by curtailed efficiency."

Contractor Pays 200% More for His Labour

Other estimates place the efficiency of building tradesmen on a much lower scale than this, but on the basis of 85 per cent. of the 1913 day's work, the contractor is today paying more than 200 per cent. more for completed work than at that time. Union rules, devised to reduce the amount of work accomplished in a given period, have been more effectively executed in the building trades than in any other.

"In matters of commerce the fault of the Dutch
Is giving too little and asking too much—"

and the labor unions, judging by this standard, must hail from Holland.

For the last three months wage advances have been actually too numerous to mention. Out of 60 representative cities, 27 report increases in one or more trades for April of this year. The number of raises, counting every trade raised in each city is 208, states "The American Contractor." Some cities report complete upward revisions. Advances in the union scale are only used, however, as a basis on which to demand a bonus, for in the larger cities at least, where the greatest volume of new building is being undertaken, practically all building labor is receiving a substantial bonus above standard scale.

And when the large part that labor plays in the cost of construction is remembered, the seriousness of the situation is apparent. According to Frank Mann, Commissioner of Tenement Houses in the City of New York:

"Labor in its complete analysis is now 85 to 87 per cent. of the cost of building, when one considers the labor necessarily put into material before it is delivered."

Is the demand for new building responsible for this unfortunate situation? Or is the speculator's greed for quick profits responsible? "Several factors are contributing to the postponement and abandonment of construction," we read in the "Brick & Clay Record":

"The 'snow-balling' of wages is the greatest of these factors. Building craftsmen are demanding excessive wages, and the shortage of men is so tremendous that wages scales have very little significance. The tradesmen are paid according to how greatly the contractor is in need of them. It is also true that there has been some increase in the price of building materials, but these advances, with few exceptions, have been very moderate. Failure of the railroads to handle full requirements of building materials has caused a scarcity in some instances which has boosted dealer prices.

"Architects are advising their clients to postpone construction, and banks are drawing tight their lines

on building loans. These are additional causes for the drop in construction volume."

In the "New York Commercial" we read that "the willingness of 'speculative' builders to pay excessively high wages in order to steal a march on competitors furnishes a new illustration of the fact that it is the reckless buyer who is responsible for excessive movements in the business cycle rather than producers and manufacturers."

"There is feverish haste to make sales or get tenants in before the speculative bubble bursts," says the "New York Times."

High wages in the building materials industries have no doubt been responsible for the rapid increase in material prices. Recent figures prepared by the "Bankers Economic Service" show that material prices range from 73% above the 1909-1913 average in the case of hemlock lumber to 219% above that level in the case of common brick. Plain white oak is 156% higher than the pre-war price, portland cement 122% above that average, and steel beams 82% higher.

One result of the high prices for building materials has been the refusal of the supply dealer, and in some cases of the manufacturer, to ship goods ordered in January when they could get plenty of orders to fill at the higher April or May figures. Another result which may be, in part, the aftermath of the refusal just mentioned, is the enormous duplication of orders to insure delivery. Says "Cement and Engineering News":

"The president of one of the great cement producing concerns states the situation in these words: 'We have noticed, time after time, that when cars are short or other causes interfere with deliveries, dealers' orders are immediately swelled, in some cases to two or even four times their requirements. A contractor requiring two cars of cement per week for a specific job will, when deliveries become slow from the company with whom he has placed the order, place similar orders with two or three or even more companies. This makes an apparent demand very much greater than the actual demand. All the cement he can use in the work is two cars per week and, when he receives deliveries to this extent, he cancels or defers shipment on the excess purchases.' The Federal Reserve Bank of Cleveland comments on this situation: 'Production was led astray by this practice a few years ago, but we believe it will be on the lookout for any repetition of this sort of thing.'"

Producers who supply the construction industry with materials may, therefore, suffer heavily if such duplicated or triplicated orders are on their books when the boom is punctured and demand falls off.

And there seems to be no doubt that the building boom has been affected to such a point that the "exhorbitant demands of labor have punctured it."

"What has happened or is happening," says Walter B. Brown, writing in the "New York Commercial," "is that building costs, because of the advances in labor and materials, have reached a point where apartments cannot be rented at figures sufficient to insure an adequate return on the investment, while dwelling houses cannot be sold to prospective occupants at a price high enough to cover the cost. In other words, there is the beginning of a buyers' strike in the building industry."

A Building Buyers Strike

The facts seem to bear out the contention. There certainly is a buyers strike.

"In New York, overcrowded Columbia University defers $10,000,000 of urgently needed construction," says "Barron's Weekly." "The Hebrew Orphan Asylum postpones a $1,000,000 extension. New York Telephone Company, still pressed for new phones, will stop at foundation work on its new $11,000,000 central building. Thompson Starrett Company halts $7,000,000 worth of work. The Statler Company holds up plans for Boston and Detroit hotels to cost $12,000,000. Such deferment in two days . . . in New York totalled $25,000,000, since the first of the month, $75,000,000 out of a $350,000,000 program for the balance of 1923. The national total of deferment must be many scores of millions."

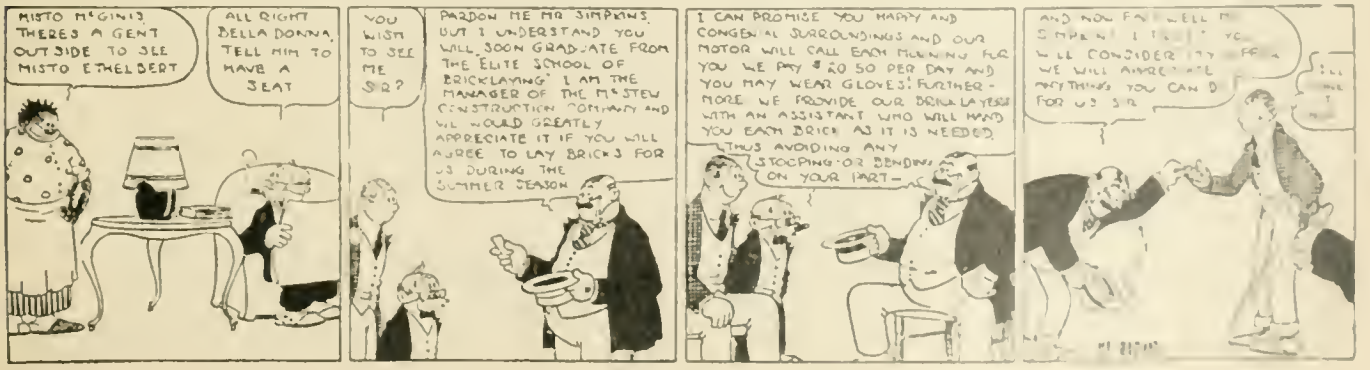
Reports from Chicago, St. Louis and San Francisco state that a similar situation exists in these sections, and it may be said that the strike has spread very rapidly over the entire country. At the direction of President Harding, Secretary Hoover made an investigation and recommended that no new Government construction be undertaken, and that work in progress be reduced as much as consistent with economy of construction and actual urgent need until private requirements have been met.

A buyers strike and a recurrence of the depression of 1920 and 1922 is foreseen by E. S. McClelland, of the Westinghouse Electric Co., Pittsburgh.

"Prices of construction materials have stopped building projects in the Pittsburgh district," he said. "Cost of material and labor has advanced so high that important construction work that should be undertaken is at a standstill, and I expect to see this condition spread."

"Building cannot go on at present prices," said

KEEPING UP WITH THE JONESES—ETHELBERT'S FUTURE IS ASSURED —By POP MOMAND


MISTO McGINIS THERE'S A GENT OUTSIDE TO SEE MISTO ETHELBERT
ALL RIGHT BELLA DONNA, TELL HIM TO HAVE A SEAT
YOU WISH TO SEE ME SIR?
PARDON ME MR SIMPKINS, BUT I UNDERSTAND YOU WILL SOON GRADUATE FROM THE ELITE SCHOOL OF BRICKLAYING. I AM THE MANAGER OF THE McSTEW CONSTRUCTION COMPANY AND WE WOULD GREATLY APPRECIATE IT IF YOU WILL AGREE TO LAY BRICKS FOR US DURING THE SUMMER SEASON
I CAN PROMISE YOU HAPPY AND CONGENIAL SURROUNDINGS AND OUR MOTOR WILL CALL EACH MORNING FOR YOU WE PAY $20 SO PER DAY AND YOU MAY WEAR GLOVES! FURTHERMORE WE PROVIDE OUR BRICKLAYERS WITH AN ASSISTANT WHO WILL HAND YOU EACH BRICK AS IT IS NEEDED
THUS AVOIDING ANY STOOPING OR BENDING ON YOUR PART—
AND NOW FARE WELL MR SIMPKINS I TRUST YOU WILL CONSIDER IT AN HONOR WE WILL APPRECIATE ANYTHING YOU CAN DO FOR US SIR

If the labor situation keeps on as it is now, this may not be as far-fetched as it seems—From Toronto Star

M. C. Shultz, of Charles A. Shultz & Sons, manufacturers of sand and retailers of builders' supplies in New Jersey:

"Builders cannot see where they are coming out at present prices," he said. "I expect a decided slowing up of business before the end of the year. Eight hours of the building trades has been established by statutes and the men by builders who are anxious to get their work done before they are overcome with additional advance in costs. Prices today are at the 1920 peak and are going higher. We recently advanced our men 15 to 20c. and the end is not yet."

Building Operations Stopping

Building operations in all parts of the United States are being halted, according to delegates to the recent convention of the National Association of Manufacturers.

A canvass of 50 manufacturers, mainly engaged in the production of construction materials or allied lines, brought the invariable report that not only were labor costs, particularly in unskilled labor, mounting steadily, but that the production per man was decreasing; labor turnover, it was added, is enormous, and it is impossible to satisfy the demand which the men have made.

Several manufacturers from Ohio, Indiana and Illinois reported that much of the unskilled labor employed worked an average of three or four days and then quit. So plentiful is work, they say, that applicants for jobs apply with lunches in their pockets, prepared to stay the day out if the work is not too heavy. If it is they get their time out at noon and try another plant that they believe offers less work for the same or higher wages.

Costs of labor and material in the Middle West, it is reported, are more than twice those of 1913, and between 35 and 40% higher than in 1921. Plasterers in Cincinnati halted one big building operation by asking $20 per day, and in Dayton a big contractor has ceased work on 75 houses because of demands of workers allied to the mounting cost of materials.

Labor Costs the Disturbing Factor

Manufacturers were agreed that the labor situation presents the most serious problem of the moment and threatens the continuation of the present prosperity. Building operations cannot continue at anything like their volume, they agreed, unless prices are stabilized and production per man is increased.

Workers in the New York district have been further accentuated by the labor situation. Labor knows that it is extremely lucky to get the present top wage and naturally sought desires to hold these gains by means of a long time agreement. Bricklayers in New York City, for instance, recently demanded a $12 a day wage for a two-year period. The Mason Builders Association, who were faced with the demands, decided that it would be mortgaging the future too heavily to agree to such a proposal in view of the likelihood of declining living costs and a possible general decline in wages during the next two years. So they struck back. And today, as a result, 2,000 to 4,000 men are idle, from $150,000,000 to $200,000,000 in contract completed construction in New York is the setting, for one contractor expressed it, "for the men to come to their senses."

Some of the contractors, representing about 20% of the uncompleted work and faced with the necessity of taking tremendous losses every day the jobs stand idle, capitulated and signed the two-year agreement. If the strike continues, between 50,000 and 60,000 men will be thrown out of work, and the total amount of new construction which will be halted will be over $250,000,000.

And will the buyers' strike have any effect on costs?

The "American Contractor" reports a conversation between an old contractor and a young builder, possibly fictitious, but none the less true, covering this point.

"Prices can't go down until the shortage of labor is overcome," said the young builder.

"They can't, can't they?" retorted the speaker. "Perhaps they can't, but I think differently. A union scale is a lovely thing, but it cannot hold out long against an empty stomach. Just wait until the building boom flattens out and you'll see men only too anxious to lay bricks, spread plaster or do anything else for barely enough to make a living. You won't get the job. Oh, no, for you are tied up in a two-year agreement; but there's nothing to hinder an outsider coming in and taking work at any figure he can get.

The Contractor Who Will Be in Clover

"Suppose I want to build a house and have just $5,000 to spend. I go to some contractor who isn't tied up to an agreement with the local labor magnates and tell him what I want and what I can pay. He goes down to union headquarters, tells the men that he can go ahead if they will agree to work for about half scale, but if they stick for $10 or $12 a day there will be no work at all. If they are hungry, what will they say?

"Why, I've seen the time, right in this town, when bricklayers followed a load of bricks up the street so as to get the chance to lay them for $1.50 a day. Too little? Of course it was. Just as much too little as the present scale is too high."

"Will labor take a cut when the crash comes?" asked the younger man.

"Search me," answered the old fellow. "Probably not, at least in the open. But union men will work at less than union rates, the same as they did in the shopmen's strike. Not in their own cities, not at all. But if Boise, Idaho, shopmen would work as strike-breakers in Portland, Ore., shops, and Salt Lake City, Utah, men, good union men, would go to Denver and do the same thing, why won't Fall River bricklayers and Boston masons sort of swap jobs in the same way when the pinch comes.

"When is it coming? I don't know. Wish I did But one thing is sure. You fellows keep on granting increased wages, and the material men keep on hoisting prices away out of sight, and the crash will come much sooner than any of us think. In fact, I'm none too sure it hasn't started now."

The Canadian Ingersoll-Rand Co., Limited, Montreal, Que., have just issued a new descriptive bulletin covering their Cameron double suction, volute centrifugal pumps. The illustrations are numerous and clearly set forth the special features of these pumps, while the text contains much useful information on the mechanical details, tests, dimension table and part list. The book is known as No. 7350-C, and will be gladly forwarded to any interested reader

Kiln Scum on Face Bricks

Caused by Soluble Salts in the Brick Mixture —Overcome by Chemical Treatment or Increased Drying Rate

By JOSEPH KEELE
Chief of Ceramic Division, Department of Mines Ottawa

Occasionally red brick is much disfigured by light patches on the surface. This bleaching or discoloration, referred to as dryer, or kiln scum, is usually caused by the presence of soluble sulphates in the brick mixture, introduced by the clay or shale, or in the water with which the batch is mixed. During the drying process these soluble salts are concentrated at the surface of the bricks, and later, in the heat of the kiln, react with the iron oxide contained in the brick body causing it to impart a buff colour to the brick instead of the usual red, or the salts may simply form a light coloured opaque film which masks the true colour of the brick.

A bad case of scumming of face brick at their plant caused much trouble and loss to Merkleys, Ltd., at Ottawa, during 1921. Late in the season samples of scummed brick were submitted to the Mines Branch with the request that the source of the trouble be located and, if possible, a means of preventing further scumming be prescribed.

This brick is made from a mixture of Utica-Lorraine shale and marine clay by the stiff mud process. A qualitative analysis of the unburned brick showed the presence of water-soluble sulphates of lime and magnesia in sufficient quantity to account for the scum on the burned ware.

Several samples of shale and clay were then tested for sulphates with the following results. The clays were found to be free from sulphates, but, in all cases, the shale contained such salts. The upper beds of shale, which are very much weathered and have been leached by surface waters, contained very little, as did the lowest unweathered shale, while the middle beds which were only partially weathered and from which the sulphate salts produced by the oxidation of pyrite had not been removed by surface water, contained a fairly large percentage.

Since these middle beds are necessarily the source of most of the shale used, it would therefore not be practicable to work on a brick mixture without introducing these trouble-causing sulphates.

The problem then was to determine the best and cheapest means of rendering the sulphate salts harmless.

Salts Rendered Insoluble

The water contained in the freshly made brick takes the soluble sulphates into solution, and as the drying process progresses the water flows by capillary action to the surface where it is evaporated, leaving its burden of soluble salts concentrated at the point where they are most harmful.

By the addition of barium carbonate to the brick mixture a reaction takes place between it and the sulphates of lime and magnesia, producing barium sulphate and carbonates of lime and magnesia, all of which are relatively insoluble and therefore not productive of scum.

On analysis, the brick mixture yielded .023 per cent. of sulphur trioxide. By calculation it was found that about three pounds of barium carbonate per 1,000 bricks would be required to completely render the soluble sulphates insoluble.

Test bricks were made up in which the proportion of barium carbonate was incorporated, and burned in the Ceramic Laboratory. They were free from scum. Following this, a trial run of 30,000 bricks containing the barium carbonate was made at the brick plant. These bricks when burned were likewise free from scum.

Subsequently, the company installed a machine at the plant to feed the barium carbonate at a uniform rate into the pug mill, and it has been reported that during the early months of 1922 there has been no further trouble from scum.

Other salts of barium might be used in place of the carbonate, but they would have to be under much closer chemical control, lest they themselves cause scum.

Drying Rate Increased

Another means by which the scum may be prevented is to greatly increase the rate of drying the green brick. If the drying progresses slowly the evaporation takes place at the surface of the brick and any soluble salts will be concentrated there. If, however, the drying is hastened beyond a certain rate, the surface of the brick quickly becomes dry, and the balance of the moisture in the body is evaporated from below the surface and thus the bulk of the soluble salts remain below the surface where they cannot produce any scumming.

This method has certain disadvantages. Some clays cannot withstand rapid drying without cracking. At best, surface checking is almost sure to develop. Then, also, in order to obtain rapid drying, alterations in the drying chambers would be necessary in some plants and additional fuel would be required where direct heat is used for drying.

What Manitoba Will Spend

The Amount of Money to be Spent on Highway Construction During the Remainder of the Present Season

By A McGILLIVRAY
Highway Commissioner, Manitoba

For the remaining portion of our fiscal year which ends August 31st, the proposed programme of highway construction in Manitoba is not as large as those of the past few years. Flood conditions which prevailed during the recent months entail considerably large expenditures for repairs. Apart from these the following expenditures are contemplated for this year on Good Roads construction, from this date, viz: Provincial expenditure in co-operation with municipalities, approximately $560,000.00, of which the province pays approximately $275,000.00 and the municipalities approximately $285,000.00.

These works will consist of the completion of certain grading contracts remaining over from last season, the building of certain links in some of our main highways, and the gravelling of other stretches of these highways previously graded and in some cases having already received a coating of gravel.

During the past winter a considerable amount of gravel was hauled on to some of these roads where it was found more economical to handle the material on sleighs. This will be spread and worked into the roads during the present season. In all it is proposed to gravel about 235 miles of highway this season.

New Timber Standards

Revised Grades for Structural Timbers are Recommended by Committee on Lumber Standards

At its last meeting the Consulting Committee on Lumber Standards approved the following recommendation on structural timber grades which originated with a sub-committee of the Lumber Manufacturers Standardization committee.

The Committee recommends that all structural timbers be divided into two general divisions to be known as 'standard' and 'common'; the standard to include that timber commercially known as merchantable longleaf in Southern pine and selected common in Douglas fir; the 'common' to include those grades designated as square edge and sound and No. 1 common in Southern pine and No. 1 common in Douglas fir, and that the present specification of the regional associations be revised along the lines of the Forest Products Laboratory's recommendation so that the grades may be given a definite working stress."

The tabulation given below shows how recently compiled suggestions of the Southern pine and Douglas groups for the proposed "standard" grade compare with the defect limitations of the "select grade" of the Forest Products Laboratory. The defect limitations noted apply to all timbers in the grade. The stress allowed timbers meeting the defect requirements of the "standard" grade will depend upon whether the material is light or medium weight or dense.

Proposed "Standard" Grade for Structural Timber

	Forest Products Lab Defect Spec. for "Select Grade"	Southern Pine Assn.* (Southern Pine)	West Coast Lumbermen's Assn. (Douglas Fir) Suggested Modifications to Forest Products Lab. "Select Grade."
	Exceptionally light material (1250 lbs. per sq. in.)		
	Medium weight material (1500 lbs. per sq. in.)	Sound timber (1400 lbs. per sq. in.)	
Rate of Growth		6 to 25 rings per in. (1600 lbs. per sq. in.)	6 to 25 rings per in (1600 lbs. per sq. in.)
Summerwood.	Dense timber (1750 lbs. per sq. in.)	Dense timber (1800 lbs. per sq. in.)	Dense timber (1800 lbs. per sq. in.)
Size of Sound and Tight Knots	Narrow faces and edges of wide faces, not to exceed ¼ width of face—maximum knot ½". Wide faces, increasing in size toward center of height to ⅓ of width of the face maximum knot ¾"	On horizontal or narrow faces shall not exceed 1/3 width of narrow face for faces less than 12" and ¼ width for faces from 12" to 16" but may increase to 1/3 or 1/4 width of wide faces respectively towards center of height of wide or vertical faces. Note—Above refers to size of sound and tight knots.	Narrow faces: not to exceed ¼ width of face permitting a maximum knot of— 1½" in 6" face 2" in 10" face 2½" in 16" face 3" in 24" face Wide faces: 3" in 6" face 4" in 10" face 5" in 16" face 6" in 24" face
Angle of Grain	1 in 15	Not to exceed 1⅛" in 12" (1 in 10.7).	
Shake	⅓ the width of the piece in green material ⅓ the width of the piece in seasoned material	Not to exceed 1/3 width of green material or ⅛ width of seasoned material.	
Wane		Total width not to exceed 1/3 width of narrow faces for 1/3 length, but may be distributed on one or more edges.	

*The Southern Pine Association wishes to call attention to the following points in connection with the above matters relating to the proposed "Standard" grade:

Rate of Growth—6 rings per inch;

Summerwood—33 1/3 per cent or 50 per cent with less than 6 rings;

Size of Sound and Tight Knots—On horizontal or narrow faces shall not exceed ¼ width of narrow face for faces less than 12" and 1/6 width for faces from 12" to 16" but may increase to 1/4 or 1/6 width of wide faces respectively towards center of height of wide or vertical faces;

Angle of Grain—Not to exceed ¾" per foot (1 in 16);

Shake—Not to exceed 1/4 width of green material and 1/8 width of seasoned material.

Note—Wane, unsound or loose knots are prohibited in this grade.

Labor Saving Devices for Road Work*

Owing to the High Proportion of Labor Cost in Highway Construction and Maintenance Any Attempts to Reduce Costs Must Depend on the Use of Mechanical Equipment

The subject of mechanical labor-saving devices in road work not only interests the engineer in the construction of roads, but claims an attention much greater on the part of every engineer and road builder in their highway maintenance problems.

This paper will cover labor-saving devices used in Monroe County. The labor items in construction prove to be approximately 50 per cent. of the total cost, and in maintenance this item runs as high as 75 per cent. of the total cost. Cost for materials going into the work either in maintenance or construction, are practically a fixed figure. The first cost, including freight on materials, remains unchanged, no matter what efforts are put forth for a reduction. This is especially true in the small counties such as Monroe. With material charges fixed, it is easy to see that if the "Cost of Doing Work" is to be lowered, the decrease must come in the reduction of the labor items. A considerable reduction in labor costs can in many cases be made by the substitution of mechanical labor-saving devices, effecting a great saving in cost, giving a better and more satisfactory result, and making the work easier and more pleasant for the laboring man. Any such device, no matter how small or simple, that will replace labor in whole or in part should not only be used but great encouragement should be given all experimentation along this line. In Monroe County, with Detroit, Monroe and Toledo pulling heavily on the manpower in our section of the State, the problem is not altogether what shall we pay the men, but where shall we get them? This condition, among others, has led us to do considerable experimental work in developing devices to suit our purpose.

The Truck Dumping Chute

One of our first successful devices to save labor, worked out by a local trucking contractor, was a dump chute on the rear of our trucks for placing the slag in uniform piles at regular intervals along the side of the road. This attachment, I believe, was first used in Monroe County in 1919.

This detachable chute consists of a U-shaped trough inserted between the end of the dump body of the truck and the open tail-gate, the chute being made long enough so as to extend beyond the right rear wheel about twelve inches. On this twelve-inch extension there is a sliding gate which the operator opens in order to allow the material to pass. By trailing a string or wire of the required length behind the truck, piles can be placed at required distances. One man in addition to the truck driver is all that is required to unload the truck. The chute places the material the proper distance from the center of the road in neat, symmetrical piles, out on the shoulder far enough so as not to interfere with traffic, and, at the same time, keeps the material together, thus reducing the percentage of waste. We feel that at least two men have been saved by the use of this chute, and that the running time of the truck has been increased at least 20 per cent. Our average cost per square yard for unloading, hauling and placing slag in piles was slightly less than one-half of a cent per square yard. Last year we placed three of these chutes on our trucks at a total cost of $103.80, or approximately $35 a piece.

Chip Spreading Wagon

In the construction of macadam roads, one of the greatest calls on labor is in the spreading of the chips after the large stones have been keyed. This is usually done by spreading from the piles on the side of the road. In 1920 some experiments were made by converting a "New Idea" manure spreader into a chip spreader. Instead of having a travelling floor, the chips were conveyed to the rear of the spreader by means of a double chain belt upon which were fastened one and one-half inch angle irons. At the rear of the spreader was a specially-developed revolving drum with horizontal compartments. As the chips reached the end of the spreader, they dropped into the horizontal compartments of the revolving drum and from there were thrown out, spreading a strip about four feet wide. A hopper box was built on the spreader increasing the capacity one and one-half yards. The wheels were widened from six to twelve inches. This was done so as not to destroy the mechanical bond of the No. 1 stone. Steam rollers pulled the spreader.

The idea as represented in this machine is very good, and one that could be used economically if some loading device other than hand labor is available. The chips were spread evenly and the quantity so regulated that there was no chance for matting. The original cost of the machine was $125, and in remodelling about $300 more was used before the machine was in a serviceable condition. This machine, together with a mechanical-loading device, not only does the work better but replaces about four men in the operation.

The Concrete Pavement Breaker

Before taking up the cement-concrete pavement breaker, a word in regard to the demand for such a device will not be out of place. The Dixie Highway, running from the north limits of the City of Monroe to the Huron River, or north county line, was built in 1918. The construction of this road was rushed as a war measure to facilitate the transportation of war trucks from Detroit to the Atlantic seaboard. The road was built about one and one-half miles from the Lake Erie shore on a clay soil, which seems to have a great attraction for water. This is true especially under the pavement slab. The subgrade underlying this pavement is made up of a more or less plastic mixture of this fine silt and water. On this yielding subgrade the plain concrete slab gives way under the extreme heavy traffic which it is called upon to bear. Generally the breaks first occur on the edges and gradually creep in to the center of the pavement. Approximately 5,000 square yards of patching was done on this 14-mile stretch last year. In order

*Presented by W. S. Cummings at the ninth annual Michigan conference on highway engineering.

was obtained to clean the road free from dust and chips. This air blast had its greatest effect upon a strip about two and one-half feet wide. By running the machine up and down the road, commencing at one edge and blowing over to the opposite side, we were able to get the surface of the road in an excellent condition for the application of the bituminous material. In doing this work, if there was any breeze the first trip of the machine was made on the windward side of the road, so that there would be no chance for the dust and chips to be blown back by the wind on the cleaned portion.

In preparing a road for its first treatment, especially if in a thickly-populated section, all people living on the road should be notified to keep all the windows and doors closed. A dust cloud of no small dimensions is formed by the blower and is quickly blown from the right-of-way. In order to assist in loosening any matter screenings on the road, wire brushes placed on a frame are lowered just in front of the rear truck wheels. Then, by making from two to four trips with the blower on each strip, the road is soon made ready for the treatment. In most instances, we found that the edges of old treated roads were very hard to clean. The earth from the shoulders and the sweepings from the road seem to form a more or less hardened mat at the edge of the metal. To assist in removing this mat, a triangular frame about 18 inches on each side was built with spikes extending through it. This frame was fastened to the side of the truck and there pulled through the matted matter along the edge, so as to engage the spikes in the mat. Then, with a small amount of loosening, a sharp blast of air would clean the edges very satisfactorily.

By comparing the cost of cleaning on roads where the surface was swept by the old method, we found a saving of two-tenths of a cent per square yard. Had the cost been the same, or slightly greater, the results obtained in treating a surface free from dust would have more than offset the additional cost.

Chip Spreading

Aside from our heavy trunk line maintenance on concrete and bituminous concrete roads, our greatest expenditure is made in the surface treatment of macadam roads. We have about 500,000 square yards of surface treated macadam roads to maintain. The method used last year in this work was to place 500-pound piles of slag equal distances apart along the side of the road, and, after the bituminous material had been applied, to spread the chips by hand. This did not prove entirely satisfactory, because of our labor shortage. Further, in order that all tar placed on the road shall be covered the same day, the distributor must be shut down about 3:30 each afternoon.

Both these conditions have led to experiments in our shop at Dundee with a mechanical chip spreader. When we succeed in securing a positive feed that will give us the quantity per square yard that we desire, our slag will be hauled to the road and placed in large 20-ton piles and there loaded into trucks by a small clam mounted on a truck. These loaded trucks, with the spreading device attached, will follow the distributor and will cover the road with chips about as quickly as the tar can be applied. We estimate that the spreading cost per square yard will be cut from 15 to 20 per cent., and all the labor required on the road will be two men on the distributor, two at the stock piles, one on the blower and the foreman.

Hints for the Contractor

Steam Shovel Clears Snow-bound Road

Snoqualmie Pass through the Cascade Mountains was clear of snow and open for traffic on May 15th, after only 18 days' work. An Erie shovel with a special 4 cu. yd. "snow dipper" started to clear the 6 miles of snow-packed road on April 24th and in spite of

Six miles of road cleared of snow by means of a steam shovel

another foot of unexpected snow that was added by a late storm the work was completed in record time.

The opening of the Snoqualmie Pass is a big event in the State of Washington, as the Sunset Highway is snow-bound during the winter months at the summit of the Cascade Mountains. As soon as the pass

The special 4-yd. dipper

is opened for traffic, the beautifully scenic Sunset Highway is at once made use of by hundreds of motorists from Eastern and Western Washington, bound on business and pleasure trips long delayed.

For the third successive year Rumsey & Jordan of Seattle have had the State Highway Department contract for removing the snow from Snoqualmie Pass, from a point 1 miles west of the summit to 2 miles east of it. Besides being unusually deep this year, the snow was nearly as compact as ice, but the contractors were able to better their time of previous years because of the special "snow dipper," 4 yd capacity on their Erie shovel.

Operation was also greatly speeded up by the use of caterpillar type mounting under the shovel, permitting it to move along without delay for laying planking, or swing around mats.

Movable Staging for Overhead Work

For work on ceilings, or other overhead work, the actual labor cost is usually increased appreciably through having to construct stagings or platforms from which to work, and also through the necessity for stopping work to move such platforms, particularly when only one or two men are using them, and help has to be called from other parts of the work to assist in the moving operation.

The Aberthaw Company of Boston has largely

Inexpensive movable platforms make plastering work easier

overcome this expense through the use of a movable staging. For overhead work it was formerly the practice to use large platforms. An ingenious foreman conceived the idea of placing wheels on one of these platforms and the result has been so satisfactory that the company has adopted the idea wherever overhead work is called for. The scheme is described in "Successful Methods" by G. W. Maker, of the Aberthaw Construction Co.

The accompanying photograph shows one of these mounted platforms in operation. While mobility is its chief feature, it should be particularly noted that the arrangement is roughly though substantially constructed at small cost from material usually available

on a construction contract. The frame is made of [illegible] usually used for form lumber, while floor form panels are used for the top. The wheels have been borrowed temporarily from concrete buggies and are supported on old form bolts driven through the platform boards.

The platforms, though crude, move with surprising ease—in fact, moving is accomplished by the workmen pushing on the ceiling with their hands and after the wheel has to be chocked to keep the platform steady. The economy of this arrangement, which permits workmen to operate continuously without frequent stops to move stages, is obvious.

As the Aberthaw Company always has a large number of construction jobs under way in different cities the total saving by the adoption of a device like that shown is a considerable item.

Building Trade in Jamaica

Considerable Activity is Evident in the Vicinity of Kingston—Large Importation of Construction Materials

Building in Jamaica came almost to a standstill during the period of inflation which lasted roughly from the middle of 1917 to the end of 1920, reports F. L. Casserly, of the office of the Canadian Trade Commissioner, Kingston, Jamaica, to the Department of Trade and Commerce. Prices during that time were abnormally high, and a cottage which could have been put up for a modest sum before the war cost a small fortune to build. The thickly populated areas of Jamaica, particularly Kingston and its environs were faced with a shortage of dwellings, and rents soared to unprecedented levels. The slump, which hit the sugar planters and other agricultural producers so disastrously, has been a boon to prospective homemakers, the cost of building being only about 50 per cent above the mean pre-war level. Thus there has been much building activity of late in Kingston and its suburbs, and many large properties are being sold and cut up into small lots. During the past six months there have been on an average 125 new buildings per month inspected by the municipal authority, in Kingston alone. No figures are available for the adjacent districts or for other parts of the island, but it is probable that this activity has been paralleled in the case of the former, where most of the better-off people who work in the city reside. Though many of the new buildings are shops, and still others are tiny cottages for the poor, quite a large proportion are middle-class houses, while a few are mansions. It should be noted that most of this construction is proceeding in a district with a population of only 85,000, the great majority of whom are compelled by poverty to endure a low standard of living; all stress must be made for this factor in any comparison with the building activity in northern areas of equal population. Thus there has been a marked increase in the demand for cement, lumber and almost every other type of building material, as well as for various household furnishings. The following notes on house construction will therefore be of interest to Canadian manufacturers.

Type of Building

The one-floor cottage or bungalow with two, three or four bedrooms and plenty of verandah space, is the type of house most in demand. Two-storey houses are going out of fashion in Jamaica, and nowadays are built only by the well-to-do. The most popular form of construction is made up of concrete foundation; brick or concrete walls in wooden frame ("nog"); wooden roof, and sometimes metal shingles. Galvanized iron sheeting is used for shops and the houses of the poorer classes.

The homes of most poor people, and also of some few of the well-to-do classes, who cannot forget the 1907 earthquake, are built of wood throughout; but this form of construction, though earthquake-proof, is very hot in a tropical country, and the risk of fire is considerably greater than in the case of a brick or concrete building. Solid brick or concrete without any wooden frame is seldom met with to-day, on account of the high cost; the walls of such a house need to be at least as thick as when "nog" is employed.

Cement and Lumber

Canadian cement now sells at about the same price as English, and between them they cover most of the demand. The quantities of Danish, Dutch and German cement used are insignificant. Owing to energetic salesmanship, the Canadian product has risen to a position of prominence in this market which it did not possess eighteen months ago.

Supplies under this heading are entirely American, and come from the southern United States, pitch pine and white pine being the varieties used in house-building, the former for outside and the latter for inside work. Houses are invariably framed up in pitch pine, which, though fairly hard, is easily worked. These woods are unfortunately very vulnerable to attack by ants, which if left to themselves will do considerable damage in the course of a few years. A well-known British creosote preparation has been in use for some years as a prophylactic, and good results are claimed for it. Its effect, however, though very lasting, is not absolutely permanent; and it seems certain that if an insect-resisting timber could be placed on the market at competitive prices, it would in a short time completely supplant pitch and white pine. Jamaica has fairly extensive supplies of tropical hard woods which are impervious to ant attack, and specimens of which are to be seen in a perfect state of preservation in buildings over a century old; but owing to the absence of a local lumbering industry, the inaccessibility of the forests and the high cost of inland transport, the cost of such lumber is prohibitive. Hence it is very exceptional for native woods to be used in house-building, except in rural districts, where small supplies of Jamaican cedar are available. There are some who believe that British Columbia Douglas fir would stand insect-ravages better than pitch or white pine. If this could be demonstrated, and if some means could be found of getting such timber to Jamaica so as to sell at competitive prices, excellent business could be done.

Shingles and Trim

Cleft cypress shingles from the Southern States are the most popular; but shingles locally manufactured from native woods have a small though increasing demand, since they usually sell at a slightly lower figure than the imported article. At present, the local industry can take care of only a small fraction of the demand, but it is helped by the customs tariff, which imposes a duty of 4s. 6d. per 1,000 preferential, and 6s. general on imported shingles.

These are mostly imported ready-made in stan-

dard sizes from the southern United States, but a certain number are manufactured by local saw mills from American pine, and also from Jamaican woods. The same applies to mouldings, cornices, architraves and other kinds of interior trim.

Plasters and Paints

A cheap lime plaster of local preparation is in almost universal use in Jamaica, and makes quite a good finish if properly mixed and laid on. All the ingredients are obtained in the island; hence, on account of its low cost, this form of plaster defies the competition of any imported article such as gypsum. After the plaster has been laid on and allowed to dry, walls are usually painted or distempered; inside walls, however, are sometimes papered.

Most of these supplies come from England, though of late American paints have been much in evidence. Ready-mixed paints are not much used. On account of their cheapness, distempers are popular. Varnishes are employed to a limited extent for interior work. A small demand has recently developed for floor paints; this gives promise of increase in view of the growing tendency of householders to abandon the traditional method of polishing floors on hands and knees with a cocoanut brush. Servants are becoming more and more averse to this laborious work, which really seems a waste of energy.

These supplies are mainly English and American; however, Canadian goods have lately been coming in, owing to energetic salesmanship.

Sanitary Fittings

Great Britain and the United States divide this trade, which has shown considerable expansion in recent years, with the growth of modern ideas on sanitation and comfort. It is only the houses of the very poor, situated beyond the range of Kingston's sewerage system, which still possess that ancient malodorous abomination the pitcloset. Water closets are in general use wherever the owners can afford them; not many of the houses noted at the beginning of this report are without this convenience. Also there is a growing demand for fixed lavatory basins with running water for bedrooms, to supplant the old-fashioned toilet set. Enamelled and galvanized sinks for kitchen and pantry are much in request; in all these articles the business is divided between Great Britain and the United States. The writer has never seen Canadian goods of this nature in any of the retail establishments in Kingston. Water closets cost, to the retail purchaser, from £7 to £15 each; lavatory basins from £4 upwards; galvanized sinks about £1 5s., and enamelled sinks about £4.

Kitchen Furnishings

Houses in this country are often delivered by the builder with kitchen stove installed. The most popular stove on the market is a well-known Scottish make which burns wood and is foolproof. A similar Canadian article, however, has lately been coming in. There is a growing demand for oil stoves, which give no smoke, are infinitely cleaner, and obviate the use of wood fuel which, besides being expensive, is a nuisance to most householders, owing to the chopping which has to be done. During the past year or so an American stove of this type has been introduced, and has done well despite its high cost; there are likewise a few makes of British oil-stoves on the market. Gas is available for cooking only in Kingston, but is very little used for this purpose.

Canadian Building Products Meet with Success in Foreign Countries

The A. B. Ormsby Company Ltd. of Toronto announce the receipt of a $40,000 order for their rolling steel doors, from Dancy & Company Ltd., of Auckland, New Zealand, the doors to be used on a large contract which the latter firm holds with the Auckland Harbour Board. The Ormsby Company in negotiating for this contract, submitted samples of the doors, accompanied by detail drawings for the inspection of the engineers, the doors being thoroughly tested in operation, following the usual procedure, before shipment. The doors made a very favourable impression with the Board's engineers who were of the opinion that they were quite the finest doors imported into the country and they were unanimous in their choice of them for this large contract. The company also announce another big order under way from New Zealand, full details of which are not available at present.

The A. B. Ormsby Company's representative in New Zealand has been inspecting the markets for the company's products in that country and Australia and reports he is very much impressed with the possibilities of them. The two large orders referred to above should do much, too, to enhance the successful marketing of these products in Australia and New Zealand.

This is a field which this company had hitherto more or less neglected, but in the future they propose not only developing trade in the countries referred to, but to go into more fully the possibilities of export trade in general. Canadian manufacturers, almost in general, seem to be wary of the success of their products in foreign competition and these markets are not being cultivated nearly as much as they might. The success of the Ormsby Company should encourage other manufacturers to an investigation of the possibilities of placing their products in other countries.

Orton and Steinbrenner Co. Reorganize

The Orton & Steinbrenner Co., 608 South Dearborn St., Chicago, Ill., manufacturers of locomotive cranes, dipper shovels and grab buckets, announce a reorganization of the company and the election of the following officers: P. A. Orton, president and general manager; E. B. Ayers, vice-president; Herbert Mertz, secretary and sales manager; Harry Shaffer, treasurer and purchasing agent; G. L. Niederst, chief engineer and Alex Orton, works manager. No change in the management, control or policy has been made, nor is any contemplated. The reorganization is occasioned only by the resignation of Mr. H. G. Steinbrenner as president and the disposal of his interest in the company.

The Orton & Steinbrenner Co. was organized in 1900; its factory and works are located in Huntington, Ind., and main offices in Chicago, Ill., with representatives in all the principal cities of the United States and Canada. Beginning with the manufacture of a standard gauge steam locomotive crane, the company has gradually increased its line until at the present time it manufactures eighteen standard models of cranes and dipper shovel—gasoline, electric and steam operated; ten different types of grab buckets, and five styles of coal crushers.

How Does the New Sales Tax Affect You? Here is a Resume of the Changes Brought Down by the Minister on June 20

The new law respecting Sales Tax which will come into effect January 1st 1924 is contained in Bill No. 230 which was introduced in the Dominion Parliament on June 20. The Bill provides for a sales tax of 6% on sale price of all goods produced or manufactured in Canada, subject to certain exemptions, to be payable by the manufacturer at time of sale, and also provides for a similar tax on the duty paid value of all importations, to be paid by the importer.

Also on Canadian goods sold by a licensed wholesaler or jobber to other than a licensed manufacturer or producer, to be computed on the price paid for the goods by the licensed wholesaler or jobber.

It is provided that in certain instances the purchaser is to be furnished with a written invoice of the goods sold, which invoice shall state separately the amount of the sales tax. This provision applies to sales by licensed manufacturers and by licensed wholesalers to wholesalers or jobbers who are not licensed under the Act. The provision also applies in respect of goods sold by an unlicensed wholesaler or jobber to a licensed manufacturer.

Exemptions From Sales Tax

Goods exported are to be exempt from the tax; also goods sold by a licensed manufacturer to another licensed manufacturer, or by a licensed wholesaler to a licensed manufacturer, to be used in, wrought into or attached to articles to be manufactured for sale and which are subject to the tax; also goods sold by a licensed manufacturer to a licensed wholesales or jobber; also goods sold by a licensed manufacturer or by a licensed wholesaler to a Provincial Government for the latter's own use; also goods sold by an unlicensed manufacturer, and good specified in the list of exemptions under the present law.

Materials for Re-Manufacture

After January 1st, licensed manufacturers will buy domestic materials for re-manufacture into other goods for sale, free from sales tax, provided the finished product is subject to sales tax when sold. If the person or firm from whom the raw material is purchased has paid a tax on such material, such firm will be entitled to a refund or deduction of the tax so paid.

A manufacturer importing raw materials to be re-manufactured into other goods for sale will be required to pay a tax of 6% on the duty paid value at the time of importation, subject to a refund of the sales tax paid on the imported raw materials when the finished product is sold, provided the finished product is subject to sales tax when sold.

A manufacturer who manufacturers goods which are exempt from sales tax will not be entitled to purchase raw materials to be used in the manufacture of such products free from tax, and on imported raw material he will not be entitled to a refund of the tax paid on importation. Likewise a manufacturer who does not receive a license, by reason of the fact that he does not manufacture or produce goods to be value of $10,000 or more during any fiscal year, will not be entitled to purchase raw materials free from tax nor to obtain a refund of the tax paid by him on imported raw materials. Such a manufacturer, however, does not have to account for sales tax on his sales.

Refunds

The first part of sub-section 8 provides for a refund to be granted to licensed manufacturers if the tax paid by them on imported materials when used in the production of a finished article is not exempt from tax.

Sub-section 8 provides that where a licensed manufacturer or a wholesaler or other dealer sells goods, on which tax has been paid, to a licensed manufacturer for re-manufacture into articles for sale, and provided the finished article is subject to the sales tax when sold, a refund of the tax paid will be granted to the vendor, manufacturer, wholesaler or dealer.

Sub-section 8 provides for a refund of the tax paid on all goods which a licensed manufacturer or a licensed wholesaler has on hand on January 1st, 1924, where such goods have been, are being, or are to be used in, wrought into or attached to articles to be manufactured or produced for sale, provided that the finished articles when sold are subject to sales tax. All

refund claims under this proviso must be presented on or before June 30th, 1924.

Sub-section 9 provides for a refund or reduction, not to exceed 25% of the sales tax, in respect of goods manufactured and sold in Canada when similar goods may be imported free of customs duty.

Sub-section 10 provides for a refund of sales tax on the re-exportation of imported goods on which customs duties have been refunded. This section also provides for a refund of tax on domestic goods which are exported.

Provision is also made in the Bill for a refund to a manufacturer, producer, wholesaler, jobber or other dealer of tax paid on goods sold to a Provincial Government for the latter's own use.

The provision in last year's sales tax law for drawback of 99% of sales tax paid on materials used, wrought into or attached to articles exported, remains in force.

Under the provisions of Sub-section 11, where a manufacturer made contracts of sale before May 12th, 1923 on the basis of the present sales tax, and goods are delivered in respect of the contract after January 1st, 1924, the Government will allow a deduction equal to the difference between the 6% rate and the rate in force when the contract was made. But no deduction will be granted in respect of deliveries made under such a contract after March 31st, 1924. All claims for such deductions are to be filed on or before June 30th, 1924.

Rentals, Royalties, Custom Work Etc.

It is proposed to apply the 6% tax to goods which are leased without being sold; to goods on which a royalty is payable; to goods manufactured by contract for labor only, and apparently, also, to goods which are manufactured for the manufacturer's own use and which are not to be sold.

The Week's Developments in a Nutshell

The outstanding event of the week has been the decided turnover in government in the Province of Ontario. The farmer government has been replaced by the old time Conservative party with amply majority over all opposition to carry on without any fear of embarrassment. Perhaps the two main points at issue were the Highway and the Hydro policies. The latter has been definitely settled by the re-election of Sir Adam Beck by a large majority; he will doubtless retain the chairmanship of the Hydro Commission. The Highway policy of the new government is apparently defined in a brief statement by premier-elect Ferguson to the effect that the plans of the former government will be carried out practically as outlined.

Another important item is the final discussion on the new sales tax. The Minister has brought in his amendments, and we suggest that our readers study these immediately to see whether there are any "hidden rocks" that can be removed before it is too late.

There is a distinct rumble of discontent in the labor market but no certainty of wide spread trouble as yet. In Ottawa the street railway employees are fighting for improved conditions and higher wages. In Sydney the coalminers are on strike with threats from the steel workers. Across the line bricklayers are on strike in New York for $25.00 a day and plasterers recently struck for $27.00. The threats of the coalminers in Pennsylvania district will tend to throw central Canada into a panic owing to the fact that no steps have been taken by those in authority to insure a supply of coal for the coming winter. All of which would seem to indicate that the worst thing that could happen to the country is a boom in business. It is foolishness to try and carry out the construction work of two or three years in a single year; it simply means bidding for labor that does not exist.

The steel companies continue very active. The Steel Company of Canada is working at capacity with orders on hand to the end of the year. This company's operations form a splendid barometer of industrial conditions generally on account of their diversified products.

A circumstance that indicates the attitude of the public mind perhaps better than anything else is the drop in stock market securities. Evidently the public is in an exceedingly cautious, almost nervous, condition. There have been so many warnings against booms that the slightest recession in the price of a stock seems to be taken as a panic signal. While this may be disconcerting at the moment it is probably a very healthy condition. At a time like the present over-confidence would be fatal. A policy of Safety First will give much better results.

The lesson that seems to be taught by the recent past then is that we should not attempt to rush matters unduly. Every move in that direction further complicates the labor and material market, particularly labor. If the men insist on continuing their exhorbitant demands the inevitable result of course will be a holiday. It is probable, however, that a little give would satisfy them.

Mainly Constructional

East and West—From Coast to Coast

[illegible] highway bridge immediately below and beside the existing Victoria bridge between Montreal and the south shore of the St. Lawrence river is recommended by the Montreal Board of Harbor Commissioners in a report to the Dominion Government. The estimated cost of erecting the bridge is given at $5,000,000. The erection of such a bridge, the commissioners state, would relieve acute traffic congestion for some time to come. The report further states that the commissioners, having as its first consideration the interest of Montreal harbor, excluded from consideration any suggestion for bridging the ship channel below St. Helen's Island, and likewise any suggestion of a tunnel. Both these projects, it is stated, would be prohibitive in cost.

The estimated cost of elevating railway lines at level crossings in the city of London and the erection of a new Union Depot, made by Mr. C. G. Bowker, General Manager of the Central Region of the C.N.R., is $8,100,000. At the city's request, a conference was held between the members of the city council and the railway authorities to revive the 17 year old proposals for these improvements, but the city council were rather shocked when Mr. Bowker submitted the above estimate of the cost. Seventeen years ago, when the matter was first proposed, it was estimated that this work would cost $1,500,000.

The Montmorency River bridge, on the St. Anne Highway, Quebec, has been declared unsafe for the heavy traffic it has to carry. The bridge is located only a few hundred yards from Montmorency Falls, one of the most picturesque spots of Canada, and it carries a heavy tourist traffic during the summer months travelling to and from the famous St. Anne de Beaupre shrine. The present bridge has been considered dangerous for some time, and though the municipalities had discussed the matter on several occasions they did not take any action. The great danger has prompted the Government to investigate. Should the municipalities not aid, the Government will request the Public Service Commission to distribute equitably the financial responsibility for work done, and the repairs will be started immediately. In this connection also, Mr. Ivan Vallee, chief engineer of the Department of Public Works, is leaving next week for Niagara Falls and other American points to view types of bridges which would be most suitable for the historic spot. The bridge is still considered safe for light traffic, and the danger not immediate, but engineers are watching to see that no heavy load is allowed to cross the river.

Messrs. Harries & Hall, well known firm of landscape engineers of Toronto, have been employed by the Civic Hospital Board, at Ottawa, to plan for the improvement and beautification of the grounds of the Civic Hospital there. $[illegible] was provided for this purpose in the [illegible] by Mr. Black, of that city.

The Foster Lumber Company at Ottawa were successful in securing the tender for the completion of the new Nurses' Home there, the figure being $100,661. Tender for the structural steel [illegible] to the Otis Fensom Company, at $61,205. Tenders for the refrigerators in the Service Building and [illegible] were let to the Pass Meagher Co. and A. [illegible], respectively, at figures of $10,000 and $10,800.

Mr. [illegible] T. Mussell, civil engineer and contractor of Trenton, Ont., is erecting a plant for the manufacture of concrete products, including concrete blocks, bricks, farm [illegible] and silos. The plant is not entirely completed as yet, but manufacturing operations are already under way.

The Sinclair Construction Co. Ltd., of Toronto, was the successful tenderer for the construction of the branch line from Swastika to the Crown Reserve Mine at Larder Lake, Ont. Construction is to be started at once, and it is expected that a force of about 1,000 men will be employed as the steel is to be completely laid before the end of the year.

City council at Toronto, recently passed a by-law to authorize the raising of $4,000,000 to provide funds for the transportation commission on account of the purchase of the Toronto Railway and to provide plant and equipment.

Personal

Mr. E. L. Dougherty, builder of Sandwich, Ont., has been appointed building inspector of the town.

Messrs. Norman D. Wilson and Arthur E. K. Bunnell, engineers of the city of Toronto, have formed a partnership under the firm name of Wilson & Bunnell, with offices in the Hamilton Trust Building, at 57 Queen St. W. Both members of the firm have had many years experience in railway and general municipal engineering and surveying. Mr. Bunnell is managing engineer of the Toronto Civic Guild.

Hon. Dr. W. H. Sutherland, Minister of Public Works of the province of British Columbia, recently completed a three-weeks tour of the province, inspecting roads. Speaking of conditions generally as he found them, Dr. Sutherland said, "Crops are good, mining operations are opening up all over the interior to a greater extent than ever before, and the lumbering industry is also away to a good start for the season. Taking it all in all British Columbia is facing one of the most prosperous years in its history."

Mr. George Wood, of Windsor, Ont., a well known contractor and builder, has recently been appointed building inspector for that city, in succession to Mr. R. Parker.

Horace L. Seymour, C.E. (Tor.) with offices in Toronto and Weston, Ont., has been appointed engineer to the Weston Water, Power and Light Commission. He is also engaged in general municipal engineering work for the town, and is acting as resident engineer for the town on the sewerage system to be installed in unsewered districts of Weston, for which work Mr. W. B. Redfern of James, Proctor & Redfern is the consulting engineer. Mr. Seymour has just recently been transferred from an associate to full member of the Engineering Institute of Canada.

Obituary

Mr. W. H. Randall, manager of the Toronto branch of the Neptune Meter Company of New York, died at his residence in Toronto recently after an illness of one month. Deceased was born at Aldershot, England, 57 years ago and came to Toronto at an early age. He was connected with the Water Works Department at Toronto for 32 years, the latter years as superintendent. He had been connected with the Neptune Meter Company for the past four years. Mr. Randall was a member of the American Water Works Association.

Trade Incorporations

Messrs. Couture & Frere, manufacturers of cement blocks, were recently registered at Montreal.

Canada Limestone Co. Ltd., with head office at Quebec, P.Q., capital $20,000, to carry on a quarrying business and to deal in limestone, granite, marble, etc.

Lac Onareau Flour Mills Stone Ltd., with head office at St. Lagnori, P.Q., capital $49,000, to carry on the business of general contractors and builders.

Verdun Dwelling Construction Co. Ltd., with head office at Verdun, P.Q., capital $20,000, to carry on a building business.

The Contract Record's

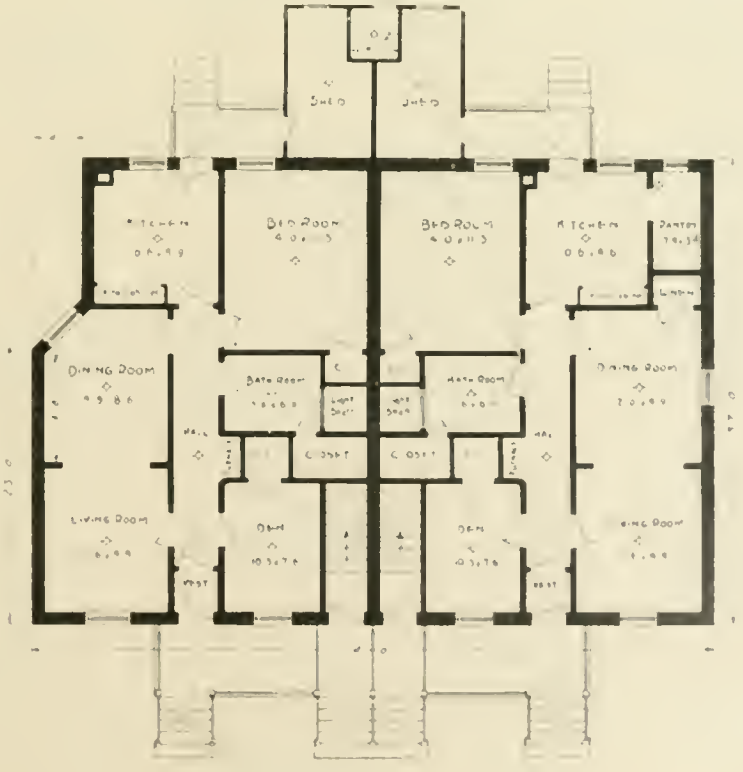
Weekly House Suggestion No. 74

The house illustrated herewith is one of a number built at Notre Dame de Grace, Montreal, and was designed by Messrs. Bastien & Cartier, architects of that city.

Economy is the outstanding feature of this house, which is one of the semi-detached type, the entire cost being $8,500. It contains four complete residences, each of five well ventilated rooms. The light required for the bathrooms of the four residences is supplied through shafts disposed on both sides of the dividing wall.

Each residence has its separate entrance and the rooms are conveniently laid out with relation to each other. The plan includes ample closet space and a fair sized pantry off the kitchen.

The front is of rustic brick and the side and rear walls of solid plastic brick. The lower residences have front and rear verandahs, as seen in the illustration, and the upper floors have balconies at the front and rear



CONSTRUCTIONAL ACTIVITY

Period of June 27 to July 3, 1923

Dominion Wide Service Exclusive to "Contract Record & Engineering Review"

Waterworks, Sewerage and Roadways

[illegible], Ont.

[illegible] Council proposes to grade, gravel and construct roads throughout the county at a cost of about [illegible] In addition to this sum the council proposes to carry out repairs and maintenance to the extent of $5,000

Haileybury, Ont.

[illegible] contemplates the erection of a pumping station and the purchase of the necessary equipment. Debentures amounting to $30,000 will be sold to provide the funds for this work

Montreal, Que.

Tenders for a force main will be received by the city council until July 10. Plans and specifications are with Montreal Water Board, 19 Atwater Ave.

The city has prepared specifications for a number of cement watermains to be laid under the Lachine canal, at Atwater Ave. Peter Bawet, city clerk, Hôtel de Ville, will receive tenders in about three weeks.

Oshawa, Ont.

The [illegible] roads and sidewalks are contemplated by the town council, as follows: pavement Simcoe St. from Duke St. to Metcalf St. and King St. from Mary St. to Prospect St., asphaltic concrete pavement Division St., Bruce, Hillcrest, Masson, Gretton, Cedar, Albert, Centennial, Arthur, Harold Sts., Drive Ave., Olive Ave. and Ritson Rd. concrete sidewalks—Alma, Caradon, [illegible], Simcoe, McGregor, St. Lawrence, Farm line east and Dulaba Ave.

Owen Sound, Ont.

The city contemplates laying sewers on the following streets at a cost of $15,-[illegible] 1st St. east to 9th Ave., east 1st Ave. [illegible] and 3rd Ave. east to Gordon, city engr.

St. Thomas, Ont.

The town council contemplates paving Talbot St. [illegible] from Metcalfe St. to Southwick St. and making a total of [illegible] Concrete curbs and gutters [illegible] on both sides of the road [illegible] Downey, City Clerk.

Sandwich, Ont.

[illegible] for the following [illegible] are contemplated by the town council: Elmwood Place, [illegible] Sandwich St. from Mount Abundance Cemetery to Peter Wood Abundance Cemetery, Tuson Ave., [illegible] miles, Pave [illegible] Sandwich St. from Chatham St. to Peter St. with [illegible] Pavement [illegible] Sandwich St. from Peter St. to Windsor [illegible] Pavement [illegible] Sandwich St. from Windsor [illegible] to Pillette Road [illegible] Pavement [illegible] Sandwich St. from Pillette Road to Walker Road [illegible] Pavement [illegible] Sandwich St. from Walker Road to Huron Church Line [illegible] Pavement [illegible] Sandwich St. from Huron Church Line to Howard Ave. [illegible] Pavement [illegible] Sandwich St. from Howard Ave. to Ouellette Ave. [illegible] Pavement [illegible] Sandwich St. from Ouellette Ave. to Dougall Ave. [illegible] Pavement [illegible] Sandwich St. from Dougall Ave. to Bridge [illegible] Pavement [illegible] Sandwich St. from Bridge to Ferry Dock [illegible] Pavement [illegible] Sandwich St. from Ferry Dock to Sandwich Ferry Dock [illegible] Pavement [illegible] Sandwich St. from Sandwich Ferry Dock to Ferry Dock [illegible] Pavement [illegible] Sandwich St. from

miles of the West Road from Observatory Hill to beyond Sluggets at a cost of $25,000.

Railroads, Bridges and Wharves

Fredericton, N. B.
Tenders for the construction of "Gulliver" bridge, Northumberland county alternative designs will be received by the Provincial Government, Department of Public Works, until July 18. Plans and specifications are at the department.
The Provincial Government will also receive tenders for the construction of "Semiwagan" bridge, Northumberland county, until July 18. Alternative designs will be considered. P. J. Venot, Minister of Public Works.

Goderich, Ont.
Huron county council contemplates spending $32,000 on bridges and culverts this year. F. R. Patterson, Goderich, engineer.

Islington, Ont.
Tenders for the construction of a reinforced concrete bridge for the Etobicoke township council will be received by Stephen Barratt, township clerk, until July 7. James, Proctor & Redfern, Toronto, consulting engineers.

Perce, Que.
Tenders will be called shortly by the town council for the construction of a metallic and concrete bridge, 90 ft. long and 25 ft. high. J. E. Vallee, Department of Public Works, Quebec, engineer.

Regina, Sask.
The city plans an extension to the street railway on 17th Ave. east, Victoria Ave. and Lindsay St. Steel and ballast have not yet been purchased.

St. Remi d'Amherst, Que.
The Provincial Department of Public Works contemplates the construction of a bridge. Materials will be furnished by the town council. P. Turcotte, town clerk.

CONTRACTS AWARDED

Chateau Richer, Que.
Napoleon & Cesaire Taillon, Chateau Richer, have the general contract for a steel bridge for the town council costing $6,600.

Toronto, Ont.
The general contract for the construction of a subway on Danforth Ave. has been awarded by the Provincial Government to the Provincial Contracting Co., 10 Adelaide St. East, at an approximate cost of $100,000.
The general contract for the construction of a steel bridge with concrete abutments across the Humber River has been awarded to Johnston Bros., Brantford, by the Provincial Highways Department, at $292,000.

Public Buildings, Churches and Schools

Ford, Ont.
Nichols & Sheppard, 15 Sandwich St. West, architects, will prepare plans for a school for the Public School Board. The building is estimated to cost $210,000.

Gore Bay, Ont.
Smith & Wright [illegible] West, Toronto, have prepared plans for a school for the Gore Bay Public School Board. The building will be two storey high, concrete block and stucco construction costing $40,000. Tenders will be called shortly.

Goderich, Ont.
The School Board will have plans prepared for the remodelling of the collegiate. It is estimated that the work will cost about $40,000. J. L. Beal, chairman of the board.

Gull Lake, Sask.
Tenders will be received by the town clerk, O. W. Howard, until July 9 for the construction of a fire hall and municipal building for the town as follows: 1, supplying all material; 2, construction only; 3, materials and construction; 4, concrete work to floor level; 5, for completion from the floor. Plans and specifications are at the clerk's office.

Haileybury, Ont.
Town council will submit a by-law to the ratepayers authorizing the construction of a fire hall at a cost of $15,000. Herbert A. Day, town clerk.

Hamilton, Ont.
The School Board will receive tenders for the installation of new pumping and drainage in Fairfield school. J. H. Foster, secretary of the board.

Kitchener, Ont.
Tenders for the construction of the Sisters of St. Joseph Hospital, Queen st. near Crescent, will be received until July 9 by Watt & Blackwell, Bank of Toronto Bldg., London. The structure is estimated to cost $140,000.

Kirkland Lake, Ont.
Tenders for the erection of a two storey school, frame and Bishopric construction, will be received by F. Clarke, secretary of the School Board, until July 14. The building is estimated to cost $40,000.

Mitchell, Ont.
Tenders for the construction of a two storey brick high school containing six rooms and an auditorium, will be received by A. D. Cameron, secretary of the School Board, until July 14. Plans and specifications for the building, which will cost about $50,000, are with the secretary and H. C. McBride, architect, Molson's Bank Bldg., London.

Moncton, N.B.
R. A. Frechette, 30 Bonaccord st., has prepared plans for an $125,000 hospital for the Roman Catholic Diocese and will supervise the construction.

Montreal, Que.
The Italian Association, c/o J. E. Patrick, architect, 11th ave., Rosemount, contemplates a college costing $200,000 to be built in the vicinity of Mile End Station.

Paris, Ont.
Shultz Bros. & Co. Ltd., 35 Albion St., general contractors, will let steel and electrical contracts for Paris High school.

Quebec, Que.
Tanguay & Chenevert, 20 D'Aiguillon St., are preparing plans for a three storey [illegible]

Toronto, Ont.
[illegible]

CONTRACTS AWARDED

Hornpayne, Ont.
George Duncan, Sudbury, has the general contract for a frame school costing $32,000 for Hornpayne School District. R. F. Mason, 75 Victoria Block, Port William, architect.

London, Ont.
Askin Methodist Church has awarded R. G. Wilson & Son, 198 Talbot St., the general contract for a brick extension 45 ft. x 80 ft., costing $45,000.

Montreal, Que.
A. D. Boileau, 245 McDougall St., has the contract for furnishing cutting and laying of all stone and brick and backing of all interior walls for the City Hall.

South Porcupine, Ont.
The Public School Board of Tisdale township has awarded F. Trudel, Timmins, the contract for labor for a $65,000 school. A. Leduc, Timmins, has the plumbing contract.

The contract for steel for St. Hermengilde Church has been awarded to Dominion Bridge Co. Ltd. Lachine, roofing, plumbing and heating contracts have been awarded to M. Chouinard, 751 Adam St.

Paris, Ont.
Shultz Bros. & Co. Ltd., 35 Albion St., general contractors, have awarded the following contracts for the erection of Paris High School, estimated to cost $50,000; Plumbing and heating, Cunningham & Co., Grand River, Paris; brick, Cooksville Brick Works, Cooksville.

Sherbrooke, Que.
Newton Dakin Construction Co. Ltd., 181 King St. W., are general contractors for a fire station for the town, estimated to cost $52,400. The building will be three storeys high, 60 ft. x 80 ft., stone and brick construction.

Strathroy, Ont.
The Hospital Board has awarded Cook & Kilpatrick, 116 Duke St., Sarnia, the plumbing and heating contract for the $20,000 nurses' home. Concrete work will be awarded by P. Pinsonneault, Strathroy.

Toronto, Ont.
[illegible]

Tenders and Proposals

Official Notices by Governments, Municipalities, Architects and Engineers

Tenders Wanted

Saturday July 7th at 2 p m
W W [illegible]

COUNTY OF LINCOLN

Tenders For Concrete Pavement

[illegible] P M

Wednesday, July 11, 1923,

[illegible] Pavement in the [illegible]

[illegible] Engineer

F N RUTHERFORD
County Engineer,
St Catharines

27

Sealed Tenders addressed to the undersigned, [illegible] for repairs to Irish Creek [illegible] will be received [illegible] 12 o'clock noon, (daylight [illegible]

Thursday, July 12th, 1923,

[illegible] Edward, County of [illegible] and [illegible] at the [illegible]

$2,[illegible]

[illegible] Works

[illegible]

[illegible] 27

RATES

20 cents per agate line (14 lines to the inch) Position Wanted 1 cent per word per insertion. Positions Vacant 2 cents per word per insertion. Box number 10 cents extra. Advertisements for this Section must be received not later than noon on Tuesday to ensure insertion in Wednesday issue.

Tenders for Improvement of Road

Pursuant to the requirements of The Canada Highways Act, sealed tenders marked "Tenders for Project H, Section N, subsection (e)" will be received by the undersigned until eleven a.m. standard time on

Wednesday, July 18, 1923,

for the excavation of approximately 27,000 cubic yards of earth and other work required in the construction of Provincial highway from Watrous north 6 miles.

Copies of plans, profiles and specifications may be seen at the office of the undersigned, and at the office of each of the following parties:

Wm. Grant, 105 Ross Block, Saskatoon, Sask.; J. R. Reid, Court House, Swift Current, Sask.; F. G. Kissack, North Battleford, Sask.; F. R. Dennett, Sec-Treas. R.M. No. 379, Cavell, Sask.

An accepted cheque for the sum of $300.00 payable to the Deputy Minister of Highways, or a Guarantee Company's bid bond, must accompany each tender.

The right to reject any or all tenders or to waive any defects or irregularities therein is to be at the discretion of the Minister of Highways. Tenders will be opened in public in the office of the Deputy Minister at the hour of three p.m. standard time, on Wednesday, July 18th, 1923.

The unauthorized insertion of this advertisement will not be paid for.

H. S. CARPENTER,
Deputy Minister of Highways.

Department of Highways,
Regina, Sask.
June 27th, 1923. 27

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for the excavation of approximately 27,000 cubic yards of earth and other work required in the construction of Provincial highway from Watrous north 6 miles.

Copies of plans, profiles and specifications may be seen at the office of the undersigned, and at the office of each of the following parties:

Wm. Grant, 105 Ross Block, Saskatoon, Sask.; J. R. Reid, Court House, Swift Current, Sask.; F. G. Kissack, North Battleford, Sask.; F. R. Dennett, Sec-Treas. R.M. No. 379, Cavell, Sask.

An accepted cheque for the sum of $300.00 payable to the Deputy Minister of Highways, or a Guarantee Company's bid bond, must accompany each tender.

The right to reject any or all tenders or to waive any defects or irregularities therein is to be at the discretion of the Minister of Highways. Tenders will be opened in public in the office of the Deputy Minister at the hour of three p.m. standard time, on Wednesday, July 18th, 1923.

The unauthorized insertion of this advertisement will not be paid for.

H. S. CARPENTER,
Deputy Minister of Highways.

Department of Highways,
Regina, Sask.
June 27th, 1923. 27

For Sale

[illegible] feet 4" pipe, 5000 lin feet of 1½" [illegible] good condition, used only two [illegible]

1 [illegible] Massey Road Grader
1 [illegible] Iron and Screen, with elevator and [illegible]
[illegible] Set Elbow Knox 6" Canal Gates
1 Set H & E Water Pumps
[illegible] Pavers
1 [illegible] Pit Road Roller

[illegible] 201, Contract Record, Toronto 25-29

Tenders for Improvement of Road

Pursuant to the requirements of The Canada Highways Act, sealed tenders marked "Tenders for Project 15, Section F, subsection (a)" will be received by the undersigned until eleven a.m. standard time on

Wednesday, July 18, 1923,

for the excavation of approximately 32,000 cubic yards of earth and other work required in the construction of Provincial highway from Raymore to Semans, 8 miles.

Copies of plans, profiles and specifications may be seen at the office of the undersigned, and at the office of each of the following parties:

Wm. Grant, 105 Ross Block, Saskatoon, Sask.; J. R. Reid, Court House, Swift Current, Sask.; F. G. Kissack, North Battleford, Sask.; Jas. S. Adams, Sec-Treas. R.M. No. 279 Semans, Sask.

An accepted cheque for the sum of $700.00 payable to the Deputy Minister of Highways, or a Guarantee Company's bid bond, must accompany each tender.

The right to reject any or all tenders or to waive any defects or irregularities therein is to be at the discretion of the Minister of Highways. Tenders will be opened in public in the office of the Deputy Minister at the hour of three p.m. standard time, on Wednesday, July 18th, 1923.

The unauthorized insertion of this advertisement will not be paid for.

H. S. CARPENTER,
Deputy Minister of Highways.

Department of Highways,
Regina, Sask.
June 27th, 1923. 27

FOR SALE

All Steel Derrick Car

This is a Standard, Steel Centre, Girder Construction Flat Car
36 feet long 100,000 lbs. Capacity,

on which is Erected Marsh & Henthorne Double Drum, Double Cylinder Engine with Two Independent Niggerheads;

Separate Friction, Swinging Gear Direct Connected to Engine;
Vertical Steel Boiler—Wooden Cab

All Steel Counterweight Derrick with 32 foot Steel Boom; Lifting Capacity about 5 Tons at 20 ft Radius.

Car is Self Propelled by Chain Drive arranged for on Both Trucks.

Complete with Cable and Blocks—
Ready for Operation.

THE MARITIME BRIDGE CO. LTD.,
27 New Glasgow, N.S.

COUNTY OF ONTARIO

Tenders For Concrete Bridge

Sealed tenders plainly marked as to contract [illegible] will be received by the undersigned [illegible] o'clock noon, [illegible]

Wednesday, July 11th, 1923

For the construction of a [illegible] Arch Truss Bridge, Span 80 feet roadway 26 feet and two 5 foot sidewalks across the Beaver River, Main street, Village of Beaverton.

Plans and Specifications may be seen and all information obtained at the office of the undersigned.

A certified cheque for 5% of the amount of tender, payable to the Treasurer of the County of Ontario or a Canadian Company's bond must accompany each tender. The lowest or any tender not necessarily accepted.

H. J. KEAN,
County Road Supt. & Engineer.

Whitby, Ont., July 2nd, 1923. 27

TOWNSHIP OF MINTO

Tenders Wanted

Tenders will be received by the undersigned up to noon on

July 16th, 1923

for the construction of three Municipal Drains in the Township of Minto, as follows:-

Drain No. 1 Open ditch, 25,800 cu. yds. of excavation.

Drain No. 12 Open ditch, 6,455 cu. yd. excavation and 3,550 lineal feet of tile drains.

Drain No. 11 Open ditch, 17,422 cu. yds. of excavation.

Plans and profiles can be seen at the office of the undersigned, Harriston, Ont.

A marked cheque for 5% of the amount of the contract must accompany each tender as guarantee of good faith and a contract bond will be required from the successful tenderer.

The lowest or any tender not necessarily accepted.

W. D. McLELLAN,
Clerk of Minto,
27-28 Harriston, Ont.

Tenders Wanted

Sealed tenders addressed to Samuel Cassel, County Clerk, Kitchener, Ont., will be received up to

July 12th, 1923

12 o'clock M., for the construction of the following:

1—1 Renforced Concrete Bridge—16' span.
2—1 Reinforced Concrete Bridge—14' span.
3—2 Reinforced Concrete Culverts— 4' span.
4—1 Renforced Concrete Culvert — 6' span.
5—1 Reinforced Concrete Culvert — 9' span.
6—Approximately 1800 square yards concrete pavement and 800 lineal feet of concrete Curb and Gutter in the Village of Ayr.
7—Approximately 3400 square yards of Macadam Roadway and 1800 lineal feet of concrete Curb and Gutter in the Town of Preston.

Plans and specifications may be seen at the office of the County Clerk, Kitchener, Ont.

L. S. LICHTY,
27 County Road Superintendent.

Corporation of the Town of Cochrane

The undersigned will receive tenders for the [illegible] of an Activated Sludge [illegible] plant to be erected in the town of Cochrane, plans and specifications of which can be seen at the office of Contract Record, 347 Adelaide street West, Toronto.

Tenders will close July 19th, and each tender will be required to deposit with it a certified cheque for 5% of contract price.

The lowest or any tender not necessarily accepted.

R. C. MORTSON,
Clerk and Treasurer,
27 Town of Cochrane, Ont.

CONTRACTORS' SUPERINTENDENT required position, will up in reinforced concrete and all classes of construction, life long experience, excellent references, quantities and estimating, apply Box 305, Contract Record, Toronto. 27

CIVIL ENGINEER DESIRES POSITION Sixteen years experience as [illegible] contractor's engineer on heavy construction work, power plants, bridge foundations and buildings, industrial engineering and quarry experience, engineer and superintendent. Box 301, Contract Record, Toronto. 27

CIVIL ENGINEER with contracting and executive experience and the very best of references would like to make connection with a going contracting firm or one from somebody who needs the services of such a man. Am in a position to invest some money in a sound proposition. Box 303, Contract Record, Toronto. 27

For Sale

Model 600, Marion Shovel, 2½ yard dipper. Boiler 140 lbs. Pressure, located at Port Arthur. Has worked only four months in gravel. $7,000 cash as it is and where it is. Apply Box 302, Contract Record, Toronto. 26-27

Steam Shovel for Sale

70C Bucyrus, in perfect condition, only slight minor repairs needed. Can be inspected at Woodman's Point Station near St. John, N.B. Price low. Apply A. M. McDonald, Kennedy & McDonald, Antigonish, N.S. 25-27

CAST IRON PIPE FOR SALE

30", 24" and 10". Cheap.

L. S. Tarshis & Sons,
26-28 Toronto.

Cableway and Plant for Sale or Rent

One cableway and [illegible] complete [illegible]

1—10 H.P. Loc motive Type [illegible]
1—Pair of cableway engines 9 x 12
2—A Frames and 8 sheaves. Wire Rope, [illegible]
We also have stiffleg derricks
1—36" Symonds Disc Crusher
2—No. 4 Jerkers and 1 No. 2 McCully Gyratory Crushers
And other miscellaneous equipment

TAFEL MACHINERY EXCHANGE
53 Mercer St., Toronto
May 8-28 27-28

Some One Wants to Buy

[illegible]

Use the Tender & Proposal Department

To Use Huge Caisson

A pneumatic caisson of record magnitude, 114 by 197 ft., to be used at Havre, France, to form the foundation of a new dry dock the size constructed, including the entire area, states an American authority. The framing of the caisson will comprise six longitudinal trusses 21 feet deep and 10 transverse trusses. The dock will accommodate vessels larger than any now in existence, say of 100,000 tons displacement, being 1,004 by 174 feet and allowing a draft of 44½ ft. The weight of the caisson will be about 8,000 tons.

Spanish Hydro Development

Important new Spanish hydro-electric installations may be divided into two groups, according to the U. S. Commercial Attache at Madrid, one lying in the Provinces of Lerida and Gerona and aggregating 146,500 horsepower, the other centering at the falls of Dos Aguas and at those of the Cinca in the Argonese Pyrenees. An estimated total of 300,000 horsepower of hydro-electric installations were underway in Spain at the beginning of 1921, of which the plant of the Riegos Fuerzas del Ebro, at Camarasa Falls, Lerida was finished during that year. Power from both of these groups is transmitted to Barcelona at 60 voltage of 110,000.

Hydro-electric resources of Spain in actual exploitation at the beginning of 1922 are estimated at from 500,000 to 600,000 horsepower. This is only about one-tenth of the potential energy possible of development.

Construction Equipment

Concrete mixers numbering 49 and valued at $56,761 were exported from the United States to foreign countries during December, 1922, according to the records of the U. S. Department of Commerce; 18 of these mixers, costing $28,795, went to Japan, and 12, valued at $16,729, to British India.

In the bucket and belt conveyor field December exports totalled 110 installations at $24,145, Japan again being the leading consumer.

Dredging machinery, weighing 576,700 lb. and costing $78,193, was exported in December, British Honduras receiving the largest quantity of the equipment, amounting to 100,000 lb. costing $12,928.

During the same month 7 pieces costing $60,171 were exported of steel [illegible] to India, [illegible] to Japan.

Diesel and Semi-Diesel engines for Denmark numbered 318 units, valued at $88,855.

During the same month [illegible] compressed and [illegible] valued at $61,477.

Business Buildings and Industrial Plants

Cornwall, Ont

Hamilton, Ont

Middleton, N.S.

Moncton, N. B.

Montreal, Que.

Ottawa, Ont.

Toronto, Ont

Truro, N. S

Weston, Ont

CONTRACTS AWARDED

Cornwall, Ont.

General contract for an extension to the Howard Smith Paper Mills, Cornwall, has been awarded to P. Dore, Valleyfield, Que., at $225,000. Phoenix Bridge & Iron Works Ltd., Montreal, will supply structural steel.

Gull Lake, Sask.

R. Erwin, Gull Lake, general contractor is excavating for a restaurant, 25 ft. x 100 ft., concrete and brick construction, costing $18,000.

Ipperwash Beach, Ont.

N. Dailey, manager of Ipperwash Beach Hotel, will supervise the construction of a two storey hotel, concrete foundation, frame construction, estimated to cost $20,000.

Mimico, Ont.

Bennett & Wright, 72 Queen St. E., Toronto, have the plumbing and heating contracts for a $30,000 factory being built here by W. F. Shenstone, Grange Rd., London, England. G. M. Miller & Co., 93 Yonge St., Toronto, architects.

Moncton, N. B.

O. J. Dunham, general contractor, Moncton, has the contract for a business block for a motion picture theatre, concrete block construction, at Oxford, N. S. The building will cost about $8,000.

Montreal, Que.

Commercial Alcohol Co., c/o John Irwin, 20 St. Paul St., has awarded Dominion Reinforcing Steel Co., the contract for reinforcing steel for the molasses distillery the company is building on Notre Dame St. E. Canadian Metal Window Co., 169 Riel St., will supply steel sash. The contract for architectural iron has been awarded to Federal Iron Works, 1112 St. Patrick St.

Montreal, Que.

Kendal Bros., 165 Iberville St., are excavating for a $2,500,000 grain elevator for Montreal Harbor Commission. Steel contract has been awarded by the commission to Canadian Vickers Ltd., Montreal, cast.

Oakville, Ont.

W. H. Hawkes, general contractor, Oakville, will build a brick theatre costing $18,000. Materials have not yet been purchased.

Regina, Sask.

T. G. Traub & Sons, general contractors, 2105 Rae St., have not yet purchased materials for an implement shed to be built in the Exhibition Grounds for Regina Agricultural and Industrial Exhibition Association, at a cost of $7,500.

St. John, N. B.

John Flood & Sons, Princess St., has the general contract for a brick garage 75 ft. x 50 ft., costing $7,000. General contractors are in the market for cement.

Toronto, Ont.

Contracts awarded for the additions to the Robert Simpson Company store are as follows: Stone, Canadian Benedict Stone Ltd., Canada Cement Bldg., Montreal; elevators and escalators, Otis-Fensom Elevator Co., Bay St., Toronto; roller shutters, A. B. Ormsby Co. Ltd., 18 Wellington St., Toronto.

Imperial Bank of Canada has awarded the following contracts for the Danforth Ave. branch; Masonry, H. N. Dancy & Son, 22 College St.; electrical, R. A. L. Gray & Co., 85 York St.; plumbing and heating, J. W. Oram, 836 Yonge St.; plastering, J. Boyce & Son, 21 Roylat Ave.

Wickett & Co. Ltd., 127 Front St. E., have the general contract for alterations to the Ault Wiborg plant, Charlotte St. The alterations will consist of an addition 55 ft. x 60 ft., mill and brick construction. Electrical, heating and plumbing contracts will be let by the architects, Sproatt & Rolph.

Residences

London, Ont.

Middlesex county council is considering the erection of a residence for the governor of the county jail. The dwelling will be built on a site adjoining the jail.

Montreal, Que.

Roofing, electrical, heating, plastering and painting contracts for two residences costing $18,000 will be let by L. Clouthier, builder, 3702 Benoni St.

P. Latendresse, 3302 St. Lawrence Blvd., will let masonry, roofing, electrical, plumbing and plastering contracts for a brick residence costing $14,000.

J. H. N. Hauteux, 762 Henri Julien St., will let masonry, roofing, electrical, plumbing, plastering and painting contracts for two residences costing $30,000.

B. O. Adam, 51 Christophe Clombe St., is receiving tenders for masonry, roofing, plastering, plumbing and heating for a $9,000 residence.

Tenders for masonry, electric wiring, plumbing, plastering and painting for a $10,000 residence will be let by E. Brazeau, 2077 Boyer St.

Ottawa, Ont.

J. S. Wilson, 256 Kent St., is excavating for an apartment house estimated to cost $100,000. Approximately 20,000 brick and materials for 40 cubic yards of concrete and 1,000 square yards of plaster will be required together with other materials necessary for construction.

Ste. Dorothee, Que.

Napoleon Goyer, Ste. Dorothee, contemplates the construction of a residence two storeys high stone and brick construction, costing $8,000.

St. John, N. B.

Armstrong & Bruce, 103 Prince William St., propose to build ten residences costing $50,000. Materials for these dwellings have not yet been purchased.

Toronto, Ont.

Tenders are being received by R. C. Cummings, 417 Beresford Ave., for plumbing, heating, electrical and plastering contracts for a residence being built on High Park Ave., at a cost of $8,500.

Roofing, plastering, electrical, heating and plumbing contracts for a residence costing $20,000 will be received by W. Pendleton, 615 Greenwood Ave.

Plans have been jprepared by D. H. Burnham, 260 Lauder Ave., for a $7,500 residence for W. F. Smyth, 327 Lauder Ave. The dwelling will be stone and

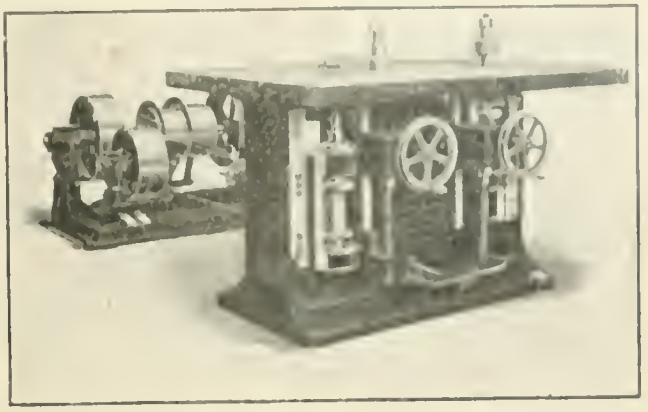
Chosen on Their Merits

"Preston" Machines Being Furnished for the Riverdale Technical School, Toronto—

Orders have been secured from the Riverdale Technical School, Toronto, for the following "Preston" woodworking machines:

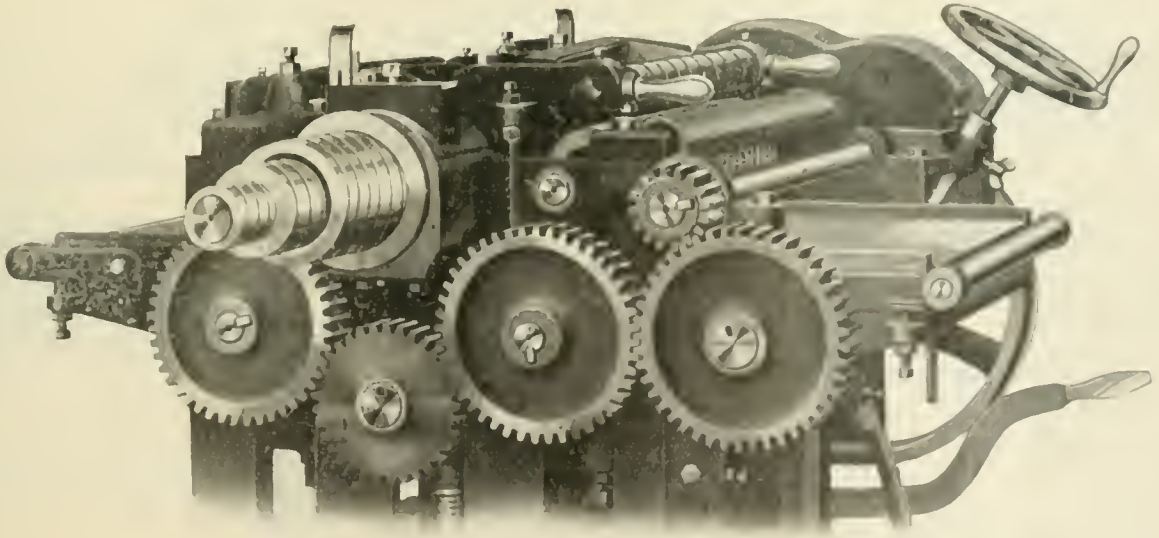
- 2 Ball Bearing Buzz Planers.
- 2 Ball Bearing Band Saws.
- 1 Ball Bearing Pony Planer (this machine equipped with round cylinder, sectional rolls and sectional chipbreaker)
- 1 Stockbridge Electric Knife Grinder.
- 1 High Speed Ball Bearing Shaper.
- 1 Ball Bearing Belt Sander.
- 1 Ball Bearing Sand Riddle.

We have also secured order for 22 machines for the Windsor Technical School, Windsor.



No. 162 "Preston" High Speed Ball Bearing Shaper

We are perhaps better posted on the Woodworking Machinery requirements of a Technical School than any other concern in Canada. We offer you the accumulated result of our years of experience. All our stock of valuable information is freely at your disposal and we know that schools just starting can save themselves a lot of expensive trouble by availing themselves of this offer which we make freely and without any other obligation than possibly a chance at their business when they are in the market



No. 121—"Preston" Pony Planer
Equipped with sectional rolls and sectional chipbreaker

The Preston Woodworking Machinery Company Limited

PRESTON, ONT., CANADA

Westmount, Que.

[illegible] Metcalfe Ave [illegible] will invite tenders for a residence costing $8,000.

CONTRACTS AWARDED

London, Ont.

[illegible] Lawrence St has been awarded the general contract for a two-story brick residence on [illegible] Dundas St costing $8,000.

[illegible] Construction Co. [illegible] Colborne St general contractors, will build a [illegible] two-storey brick residence for [illegible] W. Gleeson, Bank of Toronto Bldg. [illegible] Wilson & Son, 235 Talbot St, have the general contract for a residence [illegible] stucco, slate, concrete and brick construction, costing $11,000.

Moncton, N. B.

[illegible] Richardson, Moncton, have the contract for an $8,000 residence for [illegible] South Wilson St.

Montreal, Que.

J. Vautrin, Apartment 2, 1040 St. Hubert St., has awarded the following contracts for a $25,000 residence: Brick, National Brick Co. Ltd., 1021 Canada Cement Bldg., roofing, R. Turcot, 1681 Clark St., electrical, H. Lamarre, Delorimier St., plumbing, J. A. Francoeur, 548 Fabre St.

Nicholson Construction Co. Ltd., 950 Lafontaine St., Montreal, have the general contract for alterations to the residence owned by J. K. L. Ross, estimated to cost $70,000.

Ottawa, Ont.

The general contract for a residence costing $10,000 has been awarded to A. E. Shaver, 255 1st Ave. About 9,000 bricks and materials for thirty cubic yards of concrete will be required.

John Sutherland, 540 Rideau St., has the plastering contract for a $35,000 residence which is being built for J. R. Booth, Jr., by Holbrook & Son, Hope Bldg.

Toronto, Ont.

McCluskey & Feast, 66 Runnymede Rd., have the plastering contract for a $20,000 residence being built on Oriole Parkway by Burk & Co., 18 Toronto St.

Power Plants Electricity and Telephones

Bryson, Que.

Ottawa & Hull Power Co. Ltd., contemplate building a dam and power house at Cat Calumet Island Falls, Ottawa River, and plans will be prepared by Wm. Kennedy & Sons, Ltd., 232 St. James St., Montreal.

Miscellaneous

Hamilton, Ont.

Hamilton Harbor Commission, 47½ Main St. E., have passed estimates for new piers at Burlington Beach south costing $53,000.

CONTRACTS AWARDED

Edmonton, Alta.

Ford, Bacon & Davis, New York, U.S.A., have awarded Williams Bros., Tuls Oklahoma, U. S. A., the contract for a $3,500,000 gas pipe line from Viking to Edmonton. This contract includes all work except twelve and a half miles of the main line at Viking.

Late News

Brantford, Ont.

Brantford city council will be asked to allow the water commission to apply to the Ontario Railway Board for permission to issue $100,000 worth of debentures for capital expenditures necessitated by the demands of outlaying districts for water connections.

Hamilton, Ont.

Wentworth Suburban Roads Commission has awarded Hamilton Contracting Co. Ltd., Home Bank Bldg., Hamilton, the general contract for a concrete pavement in Barton and Binbrook townships costing $25,000.

Hartland, N. B.

Tenders for the construction of a two storey brick and steel school will be received by the school board until July 7. J. S. King, secretary of the board.

Sandwich, Ont.

Tenders for the paving of the following streets will be called by the town council shortly: Lauchette St., with curbs [illegible] to California Ave.; King St., Peter St., Alexander Ave. from Detroit to Rosedale Ave.; Rosedale Ave. from London to Peter St.

Watermains on the following streets are contemplated by the town council: Bloomfield from South St. to Prince Rd.; Alexander St. on both sides; Baley St. from Chippewa St. to South St., across Lot 1; Partington Ave. from Wyandotte St. to Craig St.; Craig St. from the end of the existing main to Partington Ave. Tenders are expected to be called shortly.

Scotstown, Que.

Letters patent have been issued to the Scotstown Granite Co. Ltd., Scotstown, to quarry, manufacture and market stone and other building materials. Capital is $250,000.

Terrebonne, Que.

Tenders will be received by the town clerk, E. Labelle, until July 15 for the construction of a concrete and iron bridge.

Thetford Mines, Que.

The Province of Quebec has issued letters patent incorporating Lynn McLeod Engineering Supplies Ltd. The company will deal in machinery and builders supplies. Capital $10,000. Head office is at Thetford Mines.

Toronto, Ont.

The Civic Works Committee has adopted Commissioner Harris' report favoring the construction of a system of drainage for North Toronto at an estimated cost of $11,121,525 to be carried out on the local improvement basis.

A Dominion Charter has been issued to the Tomlinson Construction Co., Toronto, capital $100,000. The company will operate as engineers and general contractors.

Vancouver, B. C.

Leith, Murray & Co. Winch Bldg., Vancouver, have the general contract for the construction of a terminal railway for the Vancouver Harbor Board. The work will consist of laying several diamond crossings, safety and interlocking switches, rails and other track materials.

We Issue Surety Bonds

for Contractors, for Public Highways, Contracts and all Municipal and private Corporation work.

We keep up to date information on contracts let and tenders called

Try our service.
Phone Main 3476

Special Toronto Representatives

Fidelity Insurance Co. of Canada

FIDELITY AGENCY OF CANADA

WE WILL BOND YOU

You will find us courteous, anxious to please and ready to give the best service.

Resources over $31,790,000
Canadian Securities $ 2,247,500

HEAD OFFICE 36 Toronto Street TORONTO — Arthur E. Kirkpatrick, General Manager for Canada

BRANCH OFFICES Paris Building WINNIPEG — Sidney W. Band, Assistant General Manager

112 St James St MONTREAL — W. R. Kirkpatrick, Canadian Secretary

UNITED STATES FIDELITY & GUARANTY COMPANY

Let us prove to you just how you get more for your money when you buy a Modern Design Federal Truck for your construction work.

Another **FEDERAL**

Means Another Satisfied Customer

Toronto, Ont.	- -	Jones Motor Company 291 King Street West
Montreal, Que.	- -	Lymburner Motors Inc. 3 Park Ave
Windsor, Ont.	- -	Thompson Auto 339 Pitt Street West

FEDERAL MOTOR TRUCK CO.

Detroit, Michigan

The Heat and Ventilation Which Serve Best

A uniform circulation of pure air throughout well heated buildings more nearly approaches ideal heating and ventilation than any other performance. That is what Sturtevant engineers have accomplished for the building industry.

Their services are at your disposal.

Send for Folder 606.

B. F. Sturtevant Company
of Canada, Limited.

Montreal - Galt - Toronto

Sturtevant
PUTS AIR TO WORK

Additions to Wood Block Specifications

Two new sections were added to the specifications for wood block street paving and flooring which for some time have been before the American Wood Preserves Association, states an American authority. The specifications were adopted as standard. Bituminous mastic cushion consisting of 10 per cent of bitumen, either coal tar or asphaltic oil, and 90 per cent of clean, dry screened sand may be used instead of a cement-mortar cushion. To permit the mastic to cure it is to be spread a day in advance of laying the blocks. A maintenance clause calls for inspection each summer and a surfect treatment of light tar (1/4 to 1/3 gal.) and sand when the pavement shows signs of shrinkage or open joints.

To Finish St. Paul Union Station

A contract awarded recently by the St. Paul Union Depot Co., St. Paul, Minn., to Foley Bros., of that city, provides for the completion of the new union station. The total cost of this work will be about $2,000,000, of which probably $900,000 will be spent this year, the remainder of the work being extended over the next two years.

North Carolina Awards Contracts

North Carolina State Highway Commission recently let contracts for sixteen projects, totaling 126.37 miles and costing $2,697,754, exclusive of the usual 10 per cent for engineering and contingencies. Of this mileage 54.97 miles were either of concrete, or asphaltic surface on 5-in. concrete base. The average cost per mile for this work was 31,644.

Denver Authorizes Bond Issue

Bonds to the amount of $6,500,000 were authorized at a municipal election held in Denver, Colorado, recently. The proceeds will be used for extending and enlarging the distribution system, constructing a conduit from Marston Lake to Denver and building a filter plant. Burton Lowther is chief engineer of the Denver municipal waterworks. Bonds are to constitute a lien on the system and are to be retired out of revenues from which will also come the interest.

Paris Plans Sidewalk Underground

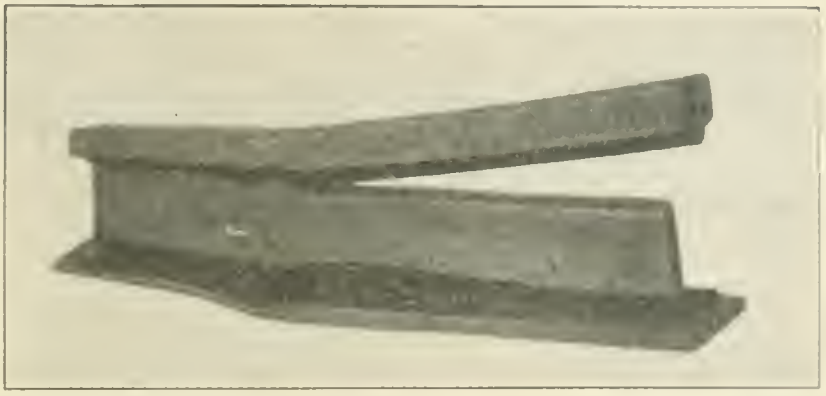
Of thirteen plans submitted for the proposed underground moving sidewalks for paris, five will be retained for experiment, according to The Engineer, London. These five will be tested over a circular distance of 300 m., in two groups. The four plans of the first group are based on the principle of parallel bands at graduated speeds, enabling passengers to step from one band to another until the most rapid is reached; landing places would be alongside the slowest band. The fifth plan is based on the idea of variable speed, slow movement at stations and higher speed between stations.

South African Railroads

It is reported that a bill has been introduced in the Parliament of the Union Government of South Africa Providing for the immediate construction of 22 short railway connections, aggregating 851 miles of line, which will involve an expenditure of substantially $90,000,000

BURLINGTON STEEL COMPANY, LIMITED

HAMILTON CANADA



"Close-up" of a rail part of which has passed through the slitting mill. Showing how the rail is slit into three separate parts—the head, web and flange.

The Re-rolled Argument

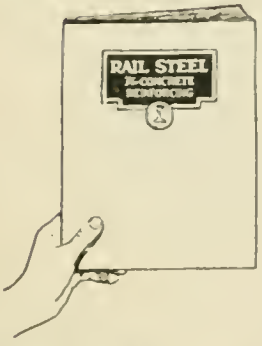
Rail Steel Reinforcing Bars are sometimes referred to as being "re-rolled." This term applied to Rail Steel is a misnomer.

In rolling Rail Steel Bars, the rail is separated into three parts, the head, web and flange; and these parts are treated individually as billets and rolled into bars, or other sections. The Rail Steel Bar is the result of a continuation of the rolling process, and is in no sense a "re-rolled" product.

The objection to the term "re-rolled" is that it permits confusion of Rail Steel Bars with bars re-rolled from various kinds of scrap, shell discard, etc.

It is important to note that the A.S.T.M. Specification A-16-14 covers "Rail Steel Concrete Reinforcement Bars," and no mention is made of "re-rolled" bars. Furthermore, under "Process" this specification stipulates that the "bars shall be rolled from standard section Tee Rails."

Rail Steel Bars are not "re-rolled" bars, and if you specify bars to meet A.S.T.M. Specification A-16-14, no undesirable re-rolled material can be substituted.



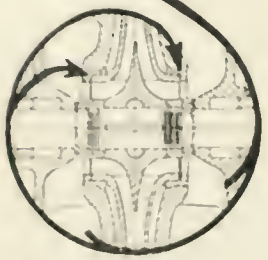
Send for This Valuable Book—FREE

The first and only authoritative and comprehensive treatise on concrete Reinforcing Bars and containing most important information on the manufacture, qualities, and use of Rail Steel Bars.

Hydraulic balance, divided casings, renewable clearance rings and highest quality at reasonable cost characterize

"Canadian" Class "S" Pumps

Double Suction impellers help assure hydraulic balance



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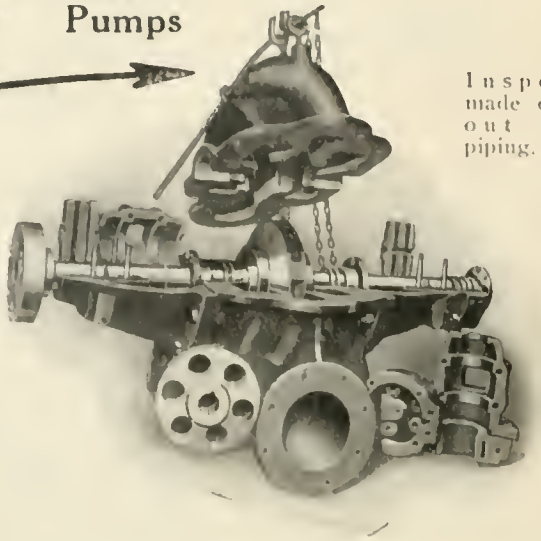

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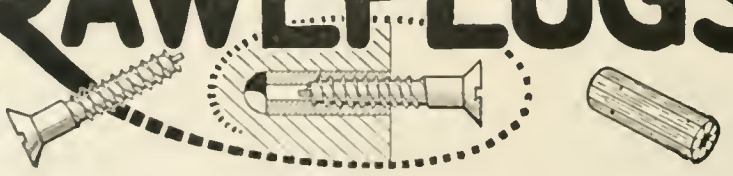

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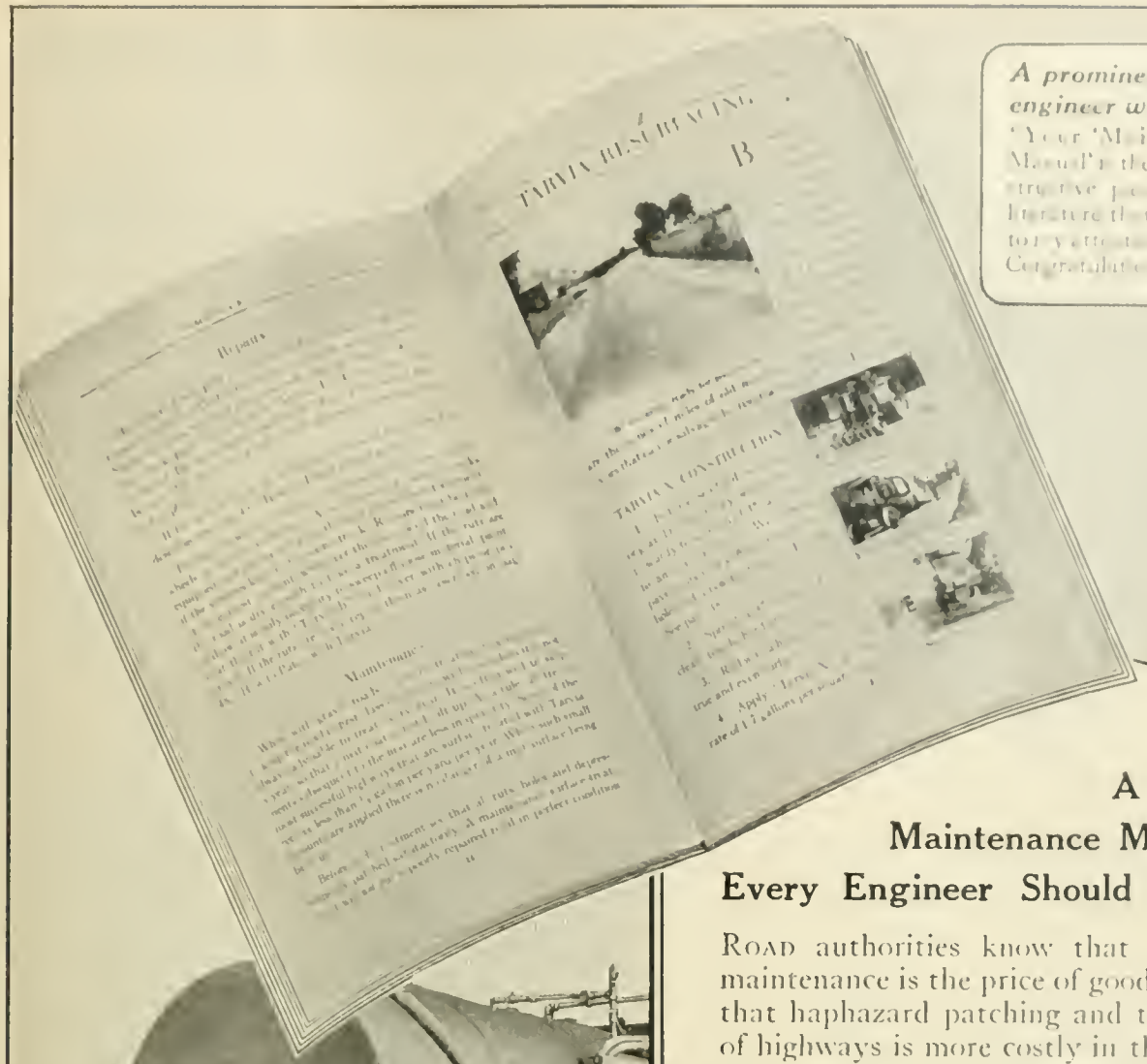

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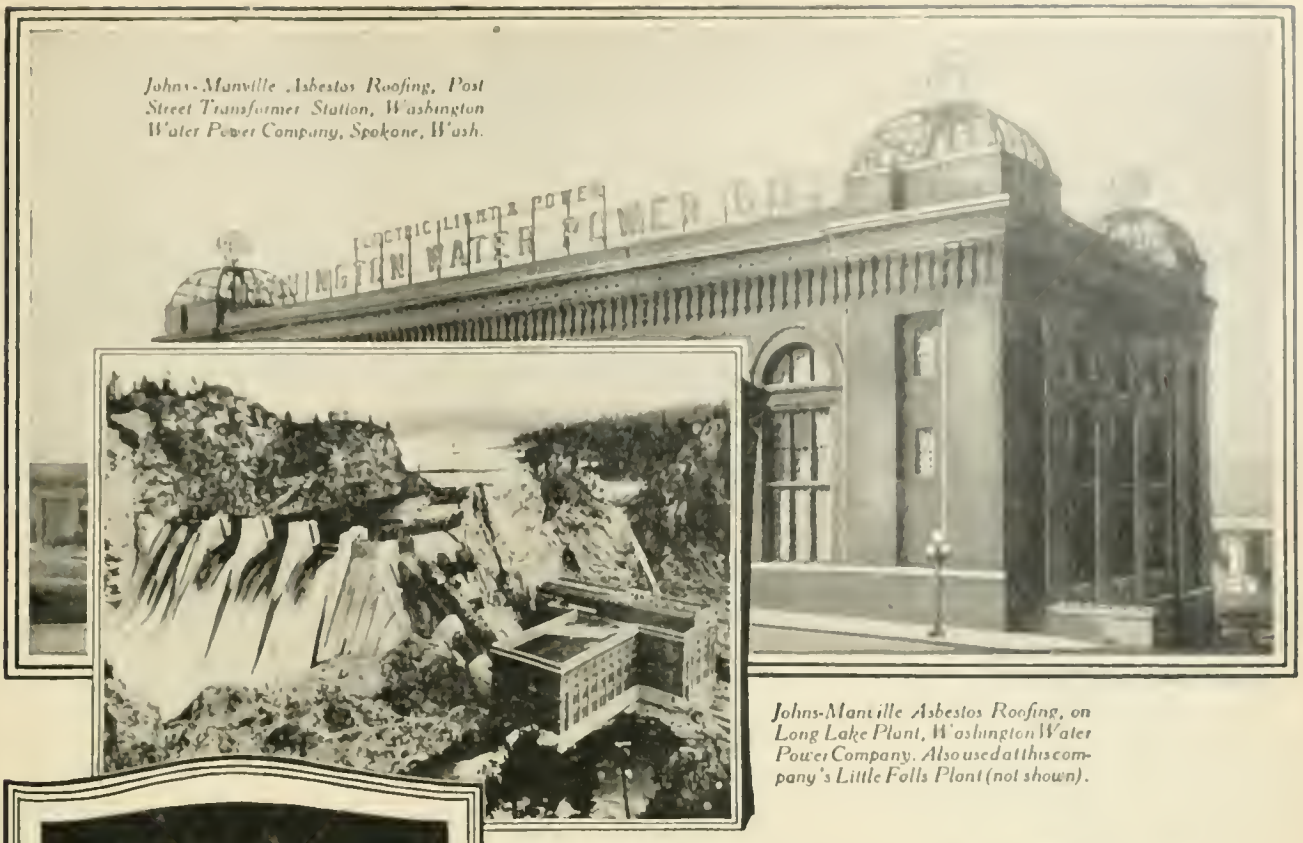

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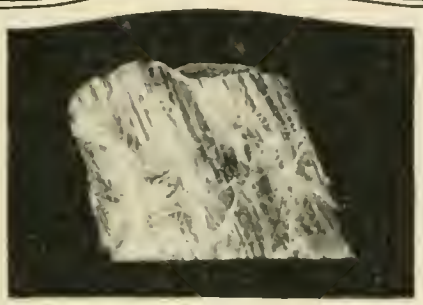

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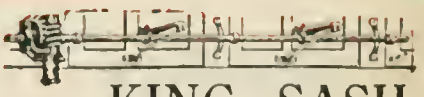
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Car lots, including bags	per bbl.	3.60	3.48	4.20	3.45
Refund on bags	each	.20	.20	.20	
LIME (Delivered on job):—					
Lump, in retail lots	per ton	11.30	13.00	.58 bu.	2.70 bbl
Lump, in car lots	per ton	12.70**	10.00	13.80 ton*	2.60 bbl
Hydrated, white in retail lots	per ton	20.00	26.00	.63 bag*	25.00
Hydrated, white in car lots	per ton	19.00	21.00	.56 bag**	25.00
Hydrated, grey in retail lots	per ton	18.75	17.75		
BRICK and TILE (Delivered on job):—					
Common face brick	per M.	24.00	16.50*	19.00	25.00
No. 1 dry pressed brick	per M.	31.00	30.00	36.00	65 00
No. 2 dry pressed brick	per M.	29.00	25.00	32.00	
Enamelled brick	per M.	125 up	180.00	185.00	150.00
Wire cut brick, for foundation work	per M.	21.00	19.00		40.00
Sand lime brick	per M	17.00		18.00	
Hollow building tile	per M.			8-12c. per ft.	105-240,00
Paving brick imported	per M.	on appl.	100.00	55.00	60.00
Fire brick	per M.	60-95	60-75	85-100	70.00
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Crusher run	per ton	2.20½		3.00 "	" "
Rubble stone	per ton	2.45	1.70	15.00 cord	" "
Gravel, 2 in. screened	per ton	2.05		2.45 yd.	" "
Gravel 1 in. screened	per ton	2.31	1.50	2.75 "	" "
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Galvanized Corrugated sheets—28 gauge	per 100 ft.	7.00 "	7.00 "	7.70	8.25-8.50
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Sewer pipe, 9 in.	per ft.	1.00	.85	.70	.60
Sewer pipe, 10 in.	per ft.	1.20	1.05	.80	.55
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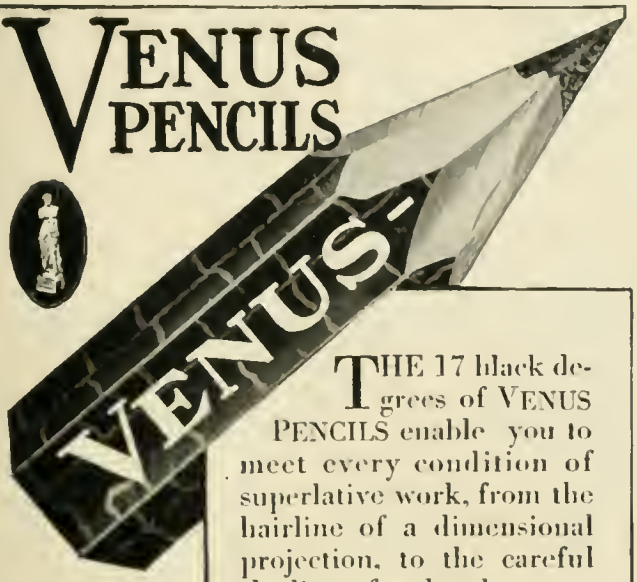

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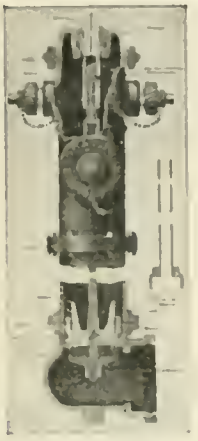

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Lumber (Delivered on job):—					
Flooring, 1 x 3 and 4 in., clear, E. G. fir	per M.	100.00	80.00	94.50	65.00
Flooring, 1 x 3 and 4 in., clear, F. G. fir	per M.	75.00	65.00	63.00	45.00
Flooring, No. 1 pine	per M.	75.00	80.00	64.80	
Flooring, No. 1 Spruce	per M.	52.00	45.00	40.50	
Flooring, birch and maple, 13/16 in. clear	per M.	135.00	110.00	171.00	200.00
Flooring, plain red oak, ⅜ in. clear	per M.	145.00	125.00	157.50	265.00
V joint, 1 x 3 and 4 in., Nos. 1 and 2, clear, fir	per M.	75.00	65.00	63.00	45.00
V joint, No. 1 pine	per M.	75.00	85.00	63.00	
Pine, 1 x 4 to 12 in., common rough	per M.	46/61	45.00	67.50	
Red and Jack Pine, 2 x 4 to 12 in., com. rough	per M.	48/58	70.00	40.50	
Hemlock, 2 x 4 to 12 in.	per M.	43/48	40.00	42.50	11.50-18.75
Fir, 1 x 4 to 12 in. No. 1 common, D 1 S	per M.	40-50.00	50.00	38.70	20.00/25.00
Spruce, 1 and 2 x 4 to 12 in.	per M.	48/60	45-35	38.70	
Timbers, fir, 10 x 10 in. and up	per M.	70.00	58.00	55.00 base	17.-22.00
Lath, No. 1 white pine	per M.	16.00	12.00	12.60	
Lath, M. R. spruce	per M.	10.00	8.50	11.25	7.00
Shingles, XXX B.C. cedar	per M.	6.50	5.00	6.30	3.40
XX B.C. cedar	per M.	4.50	4.25	4.50	1.90
N.B. extras	per M.	6.50	6.75		
N.B. clears	per M.	6.00	5.50		
Pine casing	per M.	1 ct. per in.	95.00	115.00	55.00
Fir casing	per M.	1¼ ct. per in.	100.00	115.00	70.00
PAINTS, OILS, COLOURS (delivered):—					
White lead ground in oil, less than ton lots	per cwt.	15.00	14.60	15.60	16.30
Red lead, dry, small lots	per cwt.	17.00	9.55	22.00	14.50
Putty in bulk	per cwt.	5.95	4.25	5.50	6.50
Steel sash putty in bulk	per cwt.	6.45	6.00	8.00	7.75
Boiled linseed oil, in bbls.	per gal.	1.43	1.40	1.26	1.56
Raw linseed oil, in bbls.	per gal.	1.40	1.38	1.23	1.53
Turpentine, in bbls.	per gal.	1.70	2.20	2.50	2.80
Mortar Color, maroon, in bbls.	per lb.	.02¼		.06 9/10	6.45 per cwt.
Mortar Color, black, in bbls.	per lb.	.08		.06 4/5	.45
PLASTER (Delivered):—					
Hard wall plaster, sanded	per ton	13.50	15.00	25.40	26.00
Plaster of paris, in bbl. lots	per bbl.	6.00	5.35	1.60 bag*	7.50
Plasterers' hair	per bag	2.50	7½ cts. per lb.	1.00 bu.	1.50
LABOR:—					
Bricklayers	per hr.	1.00	.80–.90	1.15	1.06¼
Structural Iron Workers	per hr.	.85	.50–.75	1.25	1.00
Plasterers	per hr.	1.25	.80	1.05	1.06¼
Hoisting Engineers	per hr.	.70–.80	.50	.90–1.10	1.00
Plumbers	per hr.	.90	.60–.75	1.00	.90
Carpenters	per hr.	.90	.65	.90	.81¼
Painters	per hr.	.75	.55–.65	.80	.81¼
Electrical Workers	per hr.	.80	.65	.70– .90	1.00
Roofers	per hr.	.65	.65		.90
Laborers (Common)	per hr.	.40–.50	.30	47½–.55	.50–.56¼
Laborers (Skilled)	per hr.	.60-.70			.90
Sheet Metal Workers	per hr.	.80			

LUMBER —*Owing to the general unstable condition of the present lumber market, Vancouver dealers refuse to quote any prices at all especially for Prairie or Eastern publication. The prices are, moreover, fluctuating from day to day. Such prices as we quote are, therefore, averages and not standard.

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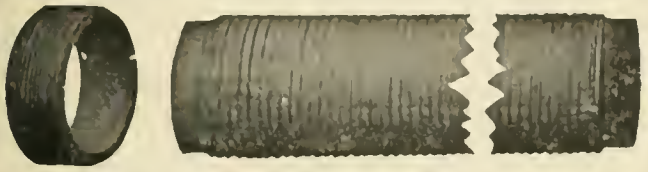

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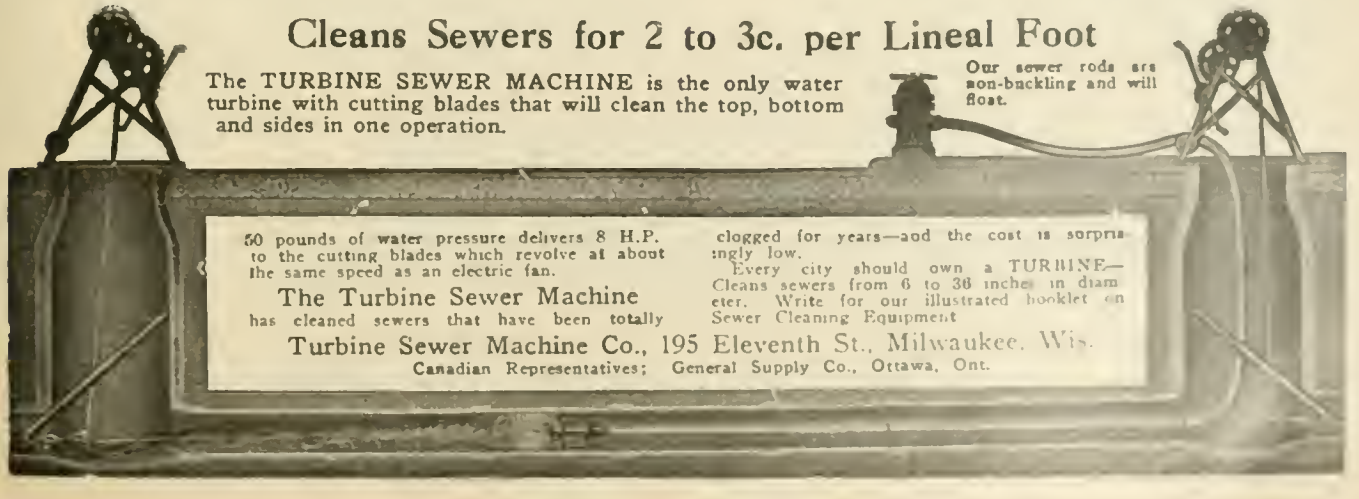

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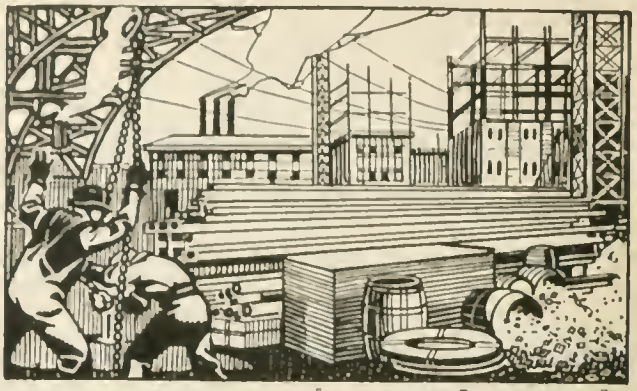

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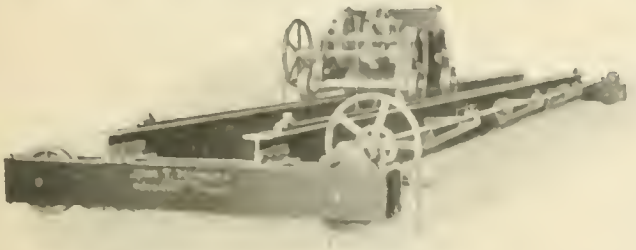

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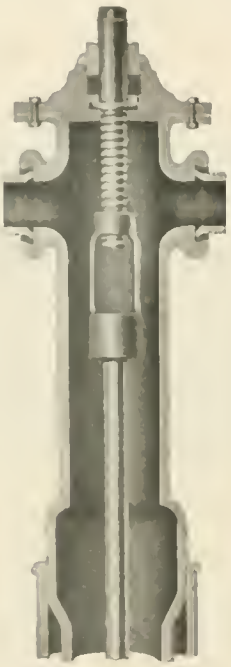

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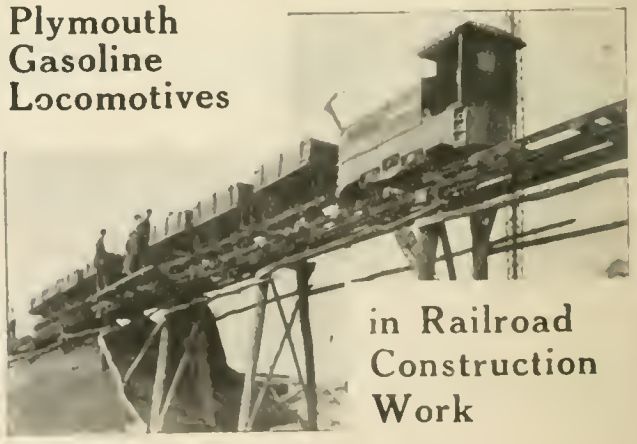

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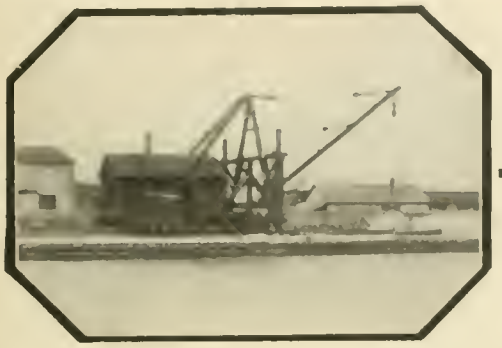

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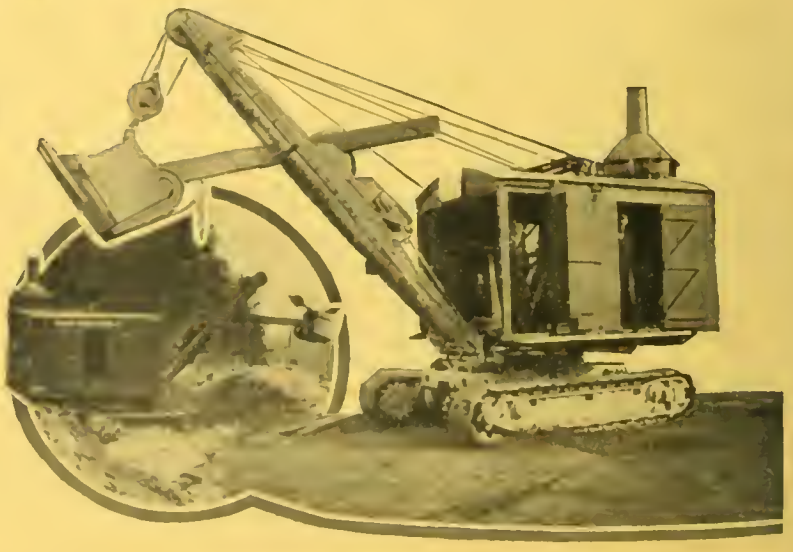
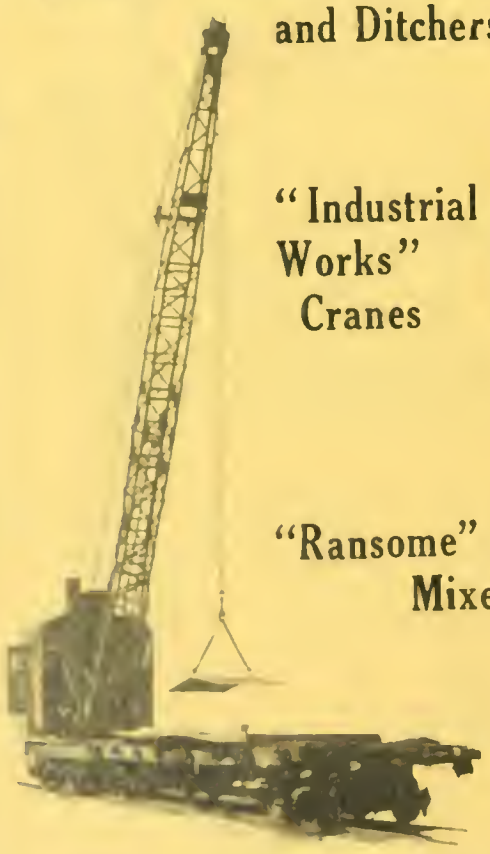
THE BIG THREE!

"Marion" Steam Shovels and Ditchers

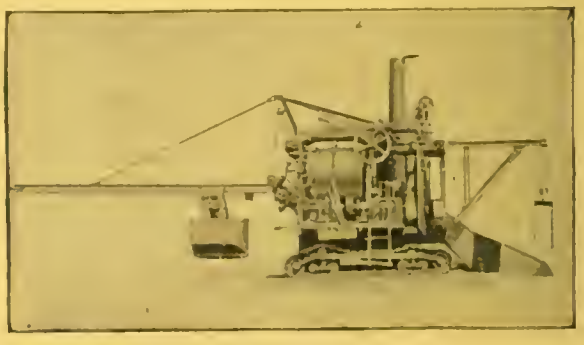


"Industrial Works" Cranes



"Ransome" Concrete Mixers

Fast Mixing and Discharge



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